SHARING AND SOCIAL RESPONSES DURING MENTALLY RETARDED CHILDREN'S PLAY

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CONTENTS

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Vivamus mea Lesbia atque amemus
Rumoresque senum severiorum unius aestimemus assis
Soles occidere et redire possunt
Nobis cum semel occidit brevis lux
Nox est perpetua una domienda.

Catullus.

Abstract

Sharing is an important skill which contributes to the social, verbal, cognitive and motor development of children. In this thesis, seven experiments were conducted to evaluate the effects of antecedent and training conditions on sharing of mentally retarded children. The aim of these experiments was to examine ways in which sharing and positive social behaviour could be facilitated. In Experiment 1, the effects of laboratory conditions were assessed with 62 mentally retarded boys. It was found that 56 participants did not share in this context. Experiment 2 was designed to compare the effects of laboratory versus classroom sessions on sharing and collateral behaviours. An alternating treatments design revealed no significant differences between conditions. Sharing remained at low levels for all participants. In Experiment 3, the effects of familiar versus novel play materials were compared in an alternating treatments design. Sharing and positive social responses occurred at low levels during both conditions. Experiment 4 involved the use of an alternating treatments design to investigate the effects of different numbers of play materials. Again, no socially significant differences were noted. Experiment 5 was designed to evaluate the effects of individual versus group reinforcement contingencies on sharing with mildly mentally retarded boys. The results showed that both contingencies substantially increased sharing, with the individual contingency producing slightly higher levels of sharing. Finally, Experiments 6 and 7 investigated the effects of say-do and do-say correspondence training procedures, respectively. A changing

criterion design was employed in both experiments to assess the effects of intervention on sharing and social behaviours during play. Verbal sharing and physical sharing were trained separately. The results showed that both procedures were effective in facilitating sharing and social behaviours. Generalization occurred across settings and behaviours. In sum, these experiments demonstrated that antecedent conditions were ineffective in the facilitation of sharing, whereas consequent procedures had marked effects. Theoretical explanations regarding the efficacy of the training procedures and implications for mentally retarded children were discussed.

Sharing and Social Responses During Mentally Retarded Children's Play

Play is an integral part of childhood experience, providing numerous opportunities for social, cognitive, motor, and language development. Due to the prevalence and significance of play, a vast number of studies exist on the topic. Many different definitions of play have been proposed, with activities as diverse as board game playing, symbolic and fantasy play, exploratory behaviour, and sports activities often included under the same definition. Some theorists have emphasized the importance of intrinsic motivation in their definitions of play. For example, Weisler and McCall (1976) offered the following definition: "Play consists of behaviors and behavioral sequences which are organism dominated rather than stimulus dominated, behaviors which appear to be intrinsically motivated and apparently performed for 'their own sake' and that are conducted with relative relaxation and positive affect" (p. 494). One problem with such definitions is that they require subjective interpretations regarding the nature of play. Caplan and Caplan (1973) proposed that play consists of almost any activity in which the toddler engages. This definition may be too general, since it includes a number of behaviours which are not generally considered to be playful including destructive actions on toys, pushing toys away, and holding objects for long periods of time without manipulation or exploration. Garvey (1974) emphasized the nonproductive nature of play, defining it as an activity which is engaged in solely for the enjoyment it provides. This definition has also been questioned due to its generality.

A more specific area of research has been devoted to the study of play as it pertains to the child's manipulation of play materials. Wehman and Marchant (1978), for example, defined free play as "any action or combination of actions with objects the child engages in for the apparent purpose of fun" (p. 101). These authors divided free play into three subgroups namely, autistic play, independent play, and social play. Autistic play was defined as destructive or no physical action with toys. Independent play consisted of any physical action with toys which was performed by one child and did not involve interaction with other people. Social play was defined as social interaction, either initiated or received, by two children or one child and one adult. The use of objective and precise definitions of play by Wehman and Marchant (1978) facilitates a more complete assessment of behavioural change.

Theories of play

A large number of theorists have speculated about the reasons why play occurs. Some early theorists (e.g., Schiller, 1875; Spencer, 1855) claimed that play is relatively purposeless and involves the release of surplus energy. The surplus energy theory has been questioned by theorists such as Groos (1898) who observed that children will play even when they are extremely tired. Hall (1906) based his ideas upon evolutionary theory, suggesting that play enables the child to act out the interests and occupations of uncivilized ancestors. These playful reenactments occur in the same historical sequence. One criticism which can be directed at early play theories is that they are too narrow and specific to encompass the complexity

and variety of play behaviour observed in children (Hughes & Noppe, 1985).

A related theory states that the child practises behavioural sequences, learning contingencies and skills which will enhance his/her performance on subsequent, more goal-directed tasks (e.g., Boll, 1957; Chateau, 1954). Groos (1901) proposed an instinctive explanation of play in which such behaviour is seen as preparing the child for life experiences. Through play, Groos argues, children practise the actual skills they require for survival. While the idea that play prepares children for future experiences is generally acceptable to contemporary theorists, the latter are more interested in the direct study of play, rather than the inferred relationship between instinctive behaviours and adult activities (Hughes & Noppe, 1985).

According to cognitive theorists play serves to facilitate intellectual development. Bruner (1973) has suggested that play enables the child to develop and practise behavioural sub-routines which may be combined at a later stage in order to deal with more complex problems. Cognitive theorists do not assume that play is equivalent to learning; rather they propose that play may provide opportunities for the child to learn basic cognitive skills which in turn may lead to the development of advanced cognitive ability.

Piaget (1962) suggested that two processes, assimilation and accomodation, contribute to the intellectual development of the individual. Assimilation occurs whenever the individual repeats familiar activities and distorts reality to match the existing level of cognition. Accommodation occurs when mental structures and

behaviours undergo changes in order to meet the demands of the world. According to Piaget, play represents an example of assimilation and consists of activities which are performed "for the mere pleasure of mastering them and acquiring thereby a feeling of virtuosity or power" (Piaget, 1962, p. 89).

Piaget (1962) has proposed three developmental levels of play, viz: practice games (sensorimotor play), symbolic games (symbolic or fantasy play), and games with rules (cooperative play). Each level of play necessitates a higher degree of cognitive skills. The most advanced level is similar to the interactions of adults, consisting of shared communication, organized cooperation and competition, and complex strategies. To participate in games at this level, the individual must demonstrate skill, intelligence, and knowledge of the rules. Smilansky (1968) extended the theory of Piaget by including four levels of play. These levels are said to occur in a developmental sequence and consist of functional play, constructive play, dramatic play, and playing games with rules. This sequence of play behaviours has been supported by several studies (Rubin & Maioni, 1975; Rubin, Maioni, & Hornung, 1976).

One of the problems with Piaget's theory, is that it fails to acknowledge the beneficial effects of play through to adulthood. According to Piaget, play is important during childhood but should disappear as the child becomes more mature in his thinking. However, as other researchers have noted, play contributes to the development of adult skills, and the effects are noticeable during later stages of life. A related observation is that individuals may engage in play behaviours throughout their adult life.

Psychoanalytic theorists have suggested that play serves to reduce tension and anxiety, since fantasies can be acted out without unpleasant environmental consequences (e.g., Erikson, 1959, 1963; Freud, 1925). However, there is little evidence to support this contention (see Weisler & McCall, 1976). Erikson (1963), one of the most influential neoanalytic theorists, has suggested that play has a practical function, enabling the child to rehearse skills which will be necessary in later life. Erikson stated: "Child's play is the infantile form of the human ability to deal with experience by creating model situations and to master reality by experiment and planning. It is in certain phases of his work that the adult projects past experiences into dimensions which seem manageable. In the laboratory, on stage, and on the drawing board, he relives the past and thus relives leftover affects; in reconstructing the model situation, he redeems his failures and strengthens his hopes. He anticipates the future from the point of view of a corrected and shared past" (p. 222).

According to Erikson, play has psychological, physical, and cultural components. He described three stages of play: autocosmic play, microsphere play, and macrosphere play. Autocosmic play occurs in the first year of life and consists of the child's exploration of his/her own body. During the second year of life, the child engages in microsphere play or, the exploration of objects. The final stage, macrosphere play, occurs when the preschool child learns about social interaction in the play context. This aids the child in his/her understanding of cultural characteristics and norms.

Behavioural theorists have also acknowledged the importance of

play in the development of various skills. Many behavioural researchers have attempted to teach or improve play behaviours in children, with special attention being given to children with play and/or social skills deficits. Assumptions that play results in cognitive gains, language development and social and emotional learning experiences have led to the application of a wide range of training procedures in an attempt to increase play activities in children.

Wehman (1977) proposed that the mentally retarded child's manipulation of play materials follows a predictable pattern which can be divided into nine levels. Bailey and Wolery (1984) grouped these into six basic levels. The first level consists of repetitive manual manipulations on toys. Level 2 consists of pounding, throwing, pushing, and pulling. Level 3 is characterised by personalized toy use in which the child employs the toys to act upon himself. The next level consists of the child's manipulation of the movable parts of toys. In Level 5, the child learns to separate parts of toys and in the final stage (Level 6) the combinational use of toys occurs. At this stage the child has learnt to use different toys in combination.

Wehman (1977) also described four levels of exploratory play which are relevant to severely and profoundly mentally retarded children. He suggested that exploratory play progresses from orientational responses, to locomotor exploration, to perceptual investigation and manipulation, and finally, to searching. It is assumed that exploratory play often does not occur spontaneously in severely handicapped children and hence it must be specifically trained.

Parten (1932) suggested that children progress from unoccupied behaviour through to cooperative play in a series of six stages of development. At the first stage, unoccupied behaviour, the child is not engaged in any purposeful activity. Instead, s/he looks around, plays with parts of his/her own body, or follows the teacher. The second stage involves solitary independent play during which the child plays alone with toys which are not being used concurrently by other children. At the third stage of play, the child engages in onlooker activities whereby s/he observes the activities of other children without particpating directly. The child is in close proximity to other children and s/he may talk to the children involved. The fourth stage consists of parallel activity during which the child plays independently, but with toys which are similar to those of the children close to him/her. The fifth stage of play is associative play during which the child is involved in the same activity as other children and talks with them about this activity. Borrowing and lending of materials may occur, and children may attempt to direct or influence the group. The final stage of play involves cooperative or organized supplementary play during which the child belongs to a play group which has a shared goal. One or two of the group members will direct the activities and make decisions concerning the division of labour and individual roles. Although this sequence of play has been consistently observed with nursery school children, it does not always follow such a distinct pattern. Brodzinsky, Gormly, and Ambron (1986) noted that all forms of play may continue throughout the lifespan.

Benefits of Play

One point of agreement among various play theorists is that play has a number of beneficial effects for child development. In particular, it allows the child to practise certain skills which may be useful in later life. One set of skills which may benefit from play behaviour are fine and gross motor skills. Various researchers have discussed the importance of play in the developmemt of motor skills (Wehman & Rettie, 1975). Other behaviours which may improve as a result of increased play are social interaction, cognitive skills, and verbalizations.

Researchers have identified some cognitive benefits of play. Lowe (1975) demonstrated that as cognitive ability increases play becomes more complex. This finding has led researchers to suggest that play provides a medium in which children practise their newly-accquired cognitive skills. Bailey and Wolery (1984) pointed out that advanced levels of play are only exhibited once the child has acquired increased capacity for representational thought. This involves the acquisition of object permanence, the development of language as a symbol system, the ability to imagine things or events not present and to represent them in some way, and the ability to see things from another person's perspective (Bailey & Wolery, 1984).

Two investigations have shown that preschool children who were provided with opportunities for free play with appropriate materials, and children who received demonstrations of problem solving, were equally effective at problem solving (Smith & Dutton, 1979; Sylva, 1977). Some investigators have demonstrated that play behaviours may also lead to increases in creativity. For example, Dansky (1980)

found that children who were given opportunities to participate in free play sessions gained higher scores on a number of creativity tasks. On the basis of these findings, it can be suggested that play activities may provide opportunities for flexible and creative thought.

Many researchers have noted the positive effects of play on social behaviours (e.g., Charlesworth & Hartup, 1967; Mueller & Lucas, 1975). Buell, Stoddard, Harris, and Baer (1968) conducted a study in which a preschool child was taught to use outdoor play equipment. It was found that increases in play behaviour were accompanied by increases in positive social interaction with peers. Peck, Apolloni, Cooke, and Raver (1978) reported similar findings in their investigation of play. When retarded preschoolers were taught to imitate the independent play responses of their nonretarded peers, social interaction also increased.

In addition to the improvement of social skills, play has beneficial effects on verbal behaviour. Buell et al. (1968) reported that the frequency of appropriate verbalizations increased when contingent reinforcement was delivered for independent play. Two related studies have indicated that the frequency of appropriate verbalizations increased when social play was encouraged (Keogh, Faw, Whitman, & Reid, 1984; Nordquist & Bradley, 1973). Other researchers have studied the quality of verbalizations within the context of play (e.g., Jeffree & McConkey, 1974), indicating improvements in play-related behaviours.

Play has also been found to have beneficial effects on the frequency of inappropriate behaviour. For example, Flavell (1973)

found that the stereotypic behaviour of three severely retarded children was reduced to zero when toy play was reinforced. Two other research groups have reported play-related reductions in stereotypic behaviour (Berkson & Davenport, 1962; Wehman, Karan, & Rettie, 1976). Reductions in aggressive behaviour (Murphy, Hutchinson, & Bailey, 1983) have also been reported. Play behaviours may serve to reduce a number of inappropriate behaviours, due to incompatibility effects.

Play and Mentally Retarded Children

Mental retardation imposes limits on the child's ability to learn play behaviours. For this reason, mentally retarded children often do not progress far along the developmental scale of play. The mentally retarded child may exhibit only basic play skills (e.g., repetitive manipulation of play materials) without formal assistance from others. Horne and Philleo (1942) compared the play of normal and mentally retarded children, and found that preference for play materials differed markedly. The mentally retarded children preferred more structured materials.

In her review of research on the play of mentally retarded children Li (1981) noted that these children are noticeably different from nonretarded children in the type and frequency of play behaviour. Tilton and Ottinger (1964) also reported that the play of mentally retarded children differs from that of nonretarded children. As a result of their observations, Tilton and Ottinger (1964) reported that mentally retarded children spent less time engaged in the combinational use of toys and more time pounding toys. Similarly, Weiner and Weiner (1974) found that retarded children exhibited less

combinational use of toys than their age-matched, nonretarded peers. Finally, Weiner, Ottinger and Tilton (1969) found that mentally retarded children interact with play materials for shorter time periods than nonretarded children.

One reason why mentally retarded children have play problems results from the fact that cognitive development and play are interdependent. This point is illustrated in a study by Wing, Gould, Yeates and Brierly (1977) who found that severely mentally retarded children engaged in symbolic play only if they had mental and language comprehension development scores of 19 months or more. Hill and McCune-Nicolich (1981) confirmed this finding when they showed that the level of symbolic play exhibited by mentally retarded children was related more to the child's cognitive ability than to chronological age.

Many researchers have attempted to treat play-skills deficits in mentally retarded children. A few research groups have manipulated antecedent events such as type and availability of play materials in an attempt to facilitate play behaviour in retarded children (e.g., Bambara, Spiegel-McGill, Shores & Fox, 1984; Jones, Favell, Lattimore & Risley, 1984; Reid, Willis, Jarman & Brown, 1978). Other researchers have investigated the effects of consequences on play behaviour (e.g., Fajardo & McGourty, 1983; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983; Strain, 1975; Wehman & Rettie, 1975). Collectively, these studies indicate that play can be facilitated using antecedent or consequent events.

Sharing

The term sharing has been used by psychologists to refer to many different behaviours including altruism, prosocial behaviour, cooperation, donating, generosity, helping, positive interaction, and, social play. Hake, Vukelich, and Olivera (1975) and Barton (1978) made the distinction between sharing, which involves the temporary lending or simultaneous use of a tangible object, altruism, when there is permanent loss of an object, and cooperation, for which the task requires two individuals to carry it out. Barton (1978) elaborated on this distinction by suggesting that sharing occurs when (a) an individual allows another to use temporarily a tangible object which the former possesses, or (b) individuals simultaneously use a material together even when it could be used alone. More recently, it has been recognized that sharing does not only involve a physical component. Researchers noted that two distinct categories of sharing were necessary namely, verbal and physical sharing (Barton & Osborne, 1978; Cooke & Apolloni, 1976; Rogers-Warren & Baer, 1976). Verbal sharing has subsequently been divided into offers to share and share acceptances (Rogers-Warren, Warren, & Baer, 1977).

According to Barton (1981) physical sharing involves: (a) handing a material to another child, (b) allowing another child to take his/her material, (c) using a particular material that another had used during the same observation interval, or, (d) simultaneously using a material with another to work on a common project. Rogers-Warren et al. (1977) have suggested that verbal sharing is "any verbalization by a child to one or more peers in which the child: (a)

requests to share another's material, (b) invites the peer to join in a particular task or activity, (c) offers to share materials directly with the peer, or (d) offers to trade materials with a peer". Finally, acceptance of share offers can be described as verbal compliance with a request to share one's materials or verbal acceptance of invitations to share another's materials.

Benefits of Sharing

Sharing has been shown to have a number of beneficial effects, the major one being to cognitive development. Odom (1981) found that the social play and the developmental level of young retarded children were significantly correlated. According to Garvey (1974), social play requires advanced cognitive skills including, the ability to discriminate between play and nonplay situations, knowledge of the rules (e.g., reciprocity and taking turns), and identification with a theme of the interaction and participation according to this knowledge. The necessary cognitive skills must be developed before true cooperative social play can occur.

The positive effects of sharing upon social behaviour are well known. Observational studies of play indicate that nonretarded preschool children share spontaneously with their peers. More importantly, sharing appears to produce reciprocal positive social interaction from peers (Charlesworth & Hartup, 1967; Tremblay, Strain, Hendrickson, & Shores, 1981). The reciprocal effects of sharing are quite important given that children who fail to share fall into a behavioural trap, failing to develop other social skills as a consequence. The ultimate result may be a lack of social interaction

skills and a continuing pattern of social isolation in adulthood.

Sharing is also thought to contribute to language development, although few studies have provided empirical proof for this suggestion. Two investigations of social play have shown that this behaviour has positive effects on the frequency of appropriate verbalization (Keogh, et al., 1984; Nordquist & Bradley, 1973). These studies suggest that sharing may result in higher levels of verbal behaviour.

Sharing and the Mentally Retarded Child

Sharing occurs naturally in the play of normal children but is seldom exhibited spontaneously by children with developmental disabilities. This important component of play behaviour is often overlooked by parents and professionals alike (see Barton, 1982). Indeed, until recently, there has been surprisingly little research conducted on the facilitation of sharing. It is of crucial importance that children with developmental disabilities learn to share since this group will not develop sharing skills by themselves and they are the most at risk of being isolated from their peers. With the current emphasis on deinstitutionalization and normalization, a large number of mentally retarded persons are being placed in community group homes where they are expected to interact appropriately with their peers, sharing household materials and developing mutually satisfying relationships. Thus, sharing represents an important skill which contributes to the long-term social adjustment of mentally retarded persons.

Developmental Approaches to the Study of Sharing.

Traditionally, psychologists have studied sharing in two ways. The first is the developmental approach in which sharing is observed and the effects of naturally occurring variables such as age, sex, race, social class, and degree of mental retardation are compared in an attempt to derive theories and develop training recommendations. Often, the study of sharing involves the use of contrived or laboratory settings so that variables such as modeling may be manipulated specifically. Developmental psychologists have focused on the differences between children in order to develop ideas concerning the nature and training of sharing. Consequently, the developmental theories of sharing are diverse in their orientation, some being based on Piagetian theory while others advocating new theoretical bases and training recommendations.

In the typical laboratory procedure, the subject is taken to the laboratory where s/he participates in a task for which s/he earns prizes or rewards. The child may then be exposed to a model demonstrating appropriate sharing. Next, the child is given the opportunity to share his/her prizes with another person. Generally, the recipient of the prize is unknown to the child and the shared prizes are simply placed in a box. The experimenter usually leaves the room or turns away from the child while s/he is deciding whether to share or not. Finally, the child is thanked for his/her participation and taken back to the classroom. At this point, the number of prizes placed in the box are counted and recorded.

Some laboratory studies have been conducted to evaluate the effects of reinforcement on sharing behaviour (see Barton,1982).

Laboratory investigations have demonstrated the potential of models to influence sharing in children (e.g., Elliot & Vasta, 1970; Rosenhan & White, 1967; Schwartz & Bryan, 1971). In addition, a number of subject variables have been shown to be important. For example, most developmental researchers have found that older children are more likely to share than younger children (Handlon & Gross, 1959; Harris, 1971; Ugurel-Semin, 1952; Wright, 1942). Other studies have revealed sex differences, with girls being more likely to share than boys. However, factors such as social class have not been shown to have differential effects on sharing (see Bryan, 1975).

There are a number of disadvantages with the developmental approach to the study of sharing. Some researchers have noted problems related to experimenter bias and demand characteristics. Bias occurs when experimenter variables such as age, sex, race, sociability, and expectancies of the experimenter influence the experimental outcomes. Demand characteristics operate when the subject perceives the desired outcome of the experiment and acts accordingly. Some researchers have raised objections based on moral, methodological, and philosophical grounds. The most common criticism relates to the artificiality of the situation. Researchers and theorists have noted that the laboratory experiment bears little relevance to real life situations. Some laboratory findings have failed to generalize to more naturalistic situations. For example, it has been shown that modeling is not as effective for facilitating prosocial behaviour in the classroom as in the laboratory (Barton, 1981; Geller & Scheirer, 1978; Rogers-Warren et al., 1977). Bronfenbrenner (1977) has challenged developmental psychologists to

move their investigations out of the laboratory and into the real world to determine if their work actually has ecological validity.

Another problem with the developmental approach is that the mere observation of sharing may not provide us with answers as to the training needs or facilitation of sharing in children. The use of correlational findings may not ultimately contribute significantly to the understanding of what maintains isolate play behaviour or sharing skills. This may be a particular disadvantage when sharing does not occur at all in the subject group. Thus, mentally retarded children and others who have such deficits may be difficult to study within the traditional laboratory context.

Behavioural Approaches to the Study of Sharing

The second approach to the study of sharing is the behavioural approach. Behavioural researchers are concerned with the assessment and training of sharing in children. Procedures used involve the manipulation of antecedent or consequent events in an attempt to modify sharing, particularly with children who have specific cognitive or social skills deficits.

A number of researchers have attempted to facilitate sharing in normal children (see Barton, 1982) using a number of procedures in a training package. Training packages have generally consisted of instructions, verbal and physical prompts, modeling, rehearsal, feedback, and positive reinforcement. Collectively, the results have indicated that training packages represent an effective method of developing sharing in normal subjects (Barton, 1981; Barton & Ascione, 1979; Bryant & Budd, 1984; Cooke & Apolloni, 1976; Peck et al., 1978).

One problem, however, is that little attempt has been made to assess the effects of individual training components leading to confusion as to which variables are producing significant effects on children's sharing. In addition, there have been few attempts to apply these procedures to children with developmental disabilities.

Another approach which has been used to facilitate sharing is positive practice. Only one published study was found which investigated the effects of this procedure on sharing. Barton and Osborne (1978) demonstrated the effectiveness of positive practice in the facilitation of sharing with five hearing-impaired children. A reversal design was used to assess training effects on verbal and physical sharing. The results indicated that positive practice produced immediate increases in physical sharing. Verbal sharing was not affected but this was probably due to the fact that subjects had hearing impairments and poor speech communication skills. Barton and Osborne (1978) collected follow-up data for 15 weeks following the termination of treatment. The results were extremely positive showing that the subjects shared at four times their baseline level after training. However, a number of confounding variables were present (e.g., uncontrolled maturational variables) which must be taken into account when interpreting the results.

Positive reinforcement has also been used to increase sharing, although only one investigation was found which evaluated the use of this procedure on its own. Warren et al. (1976) made positive reinforcement (food and praise) contingent on offers to share in two groups of preschool children. This procedure increased the percentage of share offers in all subjects. However, it was found that as share

offers increased, the percentage of offers which were accepted decreased. In the second part of their study, Warren et al. (1976) provided reinforcement contingent on the reduction of share offers to one or two per 5-minute period. This resulted in higher offer-acceptance rates.

A large number of studies have involved the use of positive reinforcement in combination with other procedures. The results of these studies are more difficult to interpret due to the confounding effects of several variables operating concurrently. Barton (1981) investigated the use of instructions, modeling, and praise provided to the peer model, on sharing of 3- and 4-year-old children. These procedures had little effect on the frequency of sharing. It was only when the subjects were provided with the opportunity to practise the model's behaviour that sharing increased.

Knapczyk and Yoppi (1975) used a token economy to increase cooperative play in educable mentally retarded children. For each 30-second interval in which the children engaged in cooperative play, they received a point and praise by the house parent. The points were displayed on a chart and could be exchanged for various materials or activities. Although the token economy produced increases in cooperation, these effects were not maintained during reversal phases.

Delayed reinforcement combined with prompts have been used by Fowler and Baer (1981) to increase share-offers and social play behaviours in seven preschool children. These researchers found that when a lengthy delay occurred between target behaviours and reinforcing events, generalization was greatly enhanced. Hart, Reynolds, Baer, Brawley, and Harris (1968) increased the cooperative

play of a 5-year-old preschool girl by prompting her peers to initiate cooperation with her and by initially reinforcing all verbalization in proximity to other children. Once the girl was engaging in low levels of cooperation, the teachers made their praise and attention contingent on this behaviour and this resulted in an increase in the frequency of cooperation.

Paloutzian, Hasazi, Streifel, and Edgar (1971) used priming and reinforcement with 10 institutionalized severely retarded children to foster three prosocial behaviours (physical affection, pulling a peer in a wagon, and smiling). This procedure was also successful in the facilitation of prosocial behaviour.

Strategic placement, a method in which low-frequency sharers are placed among high-frequency sharers, has been investigated in a number of studies. Strain, Shores, and Timm (1977) investigated the notion that children with few social skills might learn appropriate behaviour from their socially active peers. The results indicated that the social behaviour of all children was increased when socially active children were encouraged to play with their behaviourally handicapped peers. However, since the children were trained to initiate social interaction as well, it was not clear what influence strategic placement would have had on its own.

Jason, Robson, and Lipshutz (1980) and Jason, Soucy, and Ferone (1981) facilitated sharing in low-sharers by placing them in groups with high-sharers. This procedure was also effective when one high-sharer was placed in a group of low-sharers. However, treatment gains were not durable when treatment was terminated. In addition, there were a number of methodological and data analytic problems inherent in

both studies. Peck et al. (1978) failed to find any positive effects with strategic placement on its own. Current findings suggest that strategic placement, when used on its own, may be too weak to produce significant and durable changes in sharing behaviour.

Cognitive Behavioural Procedures

While there has been widespread use and acceptance of behavioural procedures for the treatment of behavioural deficits and excesses in developmentally disabled populations, the field of cognitive research has received little attention until recently. Although Skinner (1953) acknowledged the importance of cognitive events in the determination of behaviour, little research has been conducted in this area largely because of the lack of adequate research methodology. Cognitive and behavioural schools worked alongside each other but with very little interaction or interchange of ideas. This situation changed in the late 1970s when a number of clearly-defined, empirically-validated cognitive behavioural interventions were developed (see Whitman, Burgio, and Johnston, 1984). At this stage, there was growing acceptance of cognitive procedures for a number of reasons. Whitman et al. (1984) list several major reasons why this "cognitive revolution" occurred:

> "...expanding bodies of research in information processing and psycholinguistics, growing dissatisfaction with behaviorism's ability to explain and/or modify complex human behavior, and the discovery of Jean Piaget by American psychologists have contributed to a reevaluation of the adequacy of traditional behavioral conceptualizations concerning the modification of

human behavior" (p 195).

Cognitive behavioural procedures can be divided into five basic categories: self-regulation, problem solving, cognitive strategy training, correspondence training, and self-instructional training. Research with mild and moderately retarded children suggests that they can benefit in a number of ways from the use of cognitive behavioural procedures. In particular, it has been shown that mentally retarded children are capable of learning a variety of skills including self-monitoring, self-reinforcement, problem solving, self-instruction, and verbal elaboration strategies (see Whitman et al., 1984).

There are several advantages of cognitive behavioral interventions. First, they allow the person to exercise more control over his/her own behaviour. Self-control training, correspondence training, and other cognitive behavioural procedures appear to give the subject more responsibility for his actions. This is especially important for mentally retarded persons who traditionally have received training or treatment programs from significant others. It gives them the opportunity to make decisions about their behaviour and to participate in the treatment program. A second advantage with cognitive behavioural interventions is that they facilitate generalization and maintenance. This suggestion requires further assessment since few studies have been conducted in this area. Many cognitive behavioural investigations have been criticised on methodological grounds. In the majority of studies, the acquisition of cognitive skills was inferred from the fact that following training beneficial changes occurred on tasks assumed to require cognitive mediation.

Correspondence training is a relatively new procedure which is based on the assumption that it is possible to control nonverbal behaviour by modifying verbal behaviour. Three correspondence procedures have been employed in the research to date, namely, do-say, say-do, and show-do procedures. With do-say correspondence training, the subject is provided with the opportunity to engage in the target behaviour and then s/he is asked to report whether or not s/he engaged in the behaviour. The subject is reinforced when there is correspondence between the verbal report and actual behaviour. With the say-do procedure, the subject must first verbalise his/her intentions with respect to the target behaviour and then he/she is given the opportunity to engage in the target behaviour. The subject is reinforced if his/her verbally stated intentions are in agreement with the his/her actual behaviour. The show-do procedure is particularly useful when subjects have speech problems or disabilities. In this procedure, a trainer describes the target behaviour to the child, who is then asked to demonstrate the target behaviour to the instructor. Next, the child is given the opportunity to perform the behaviour. If s/he performs it as specified, then reinforcement is provided. With all correspondence training procedures, no reinforcement is given when noncorrespondence occurs. Thus, if the child incorrectly states that he/she has performed the behaviour, the instructor informs the child of his/her mistake and encourages him/her to do better at the next opportunity.

Correspondence training has been used to teach a wide range of behaviours in children. Some behaviours include choice of play materials (Israel & Brown, 1977; Israel & O'Leary, 1973; Risley &

Hart, 1968), toy play behaviours (Baer, William, Osnes, & Stokes, 1984), desirable home behaviours (Baer, Osnes, & Stokes, 1983), conversation skills (Jewett & Clark, 1979; Osnes, Guevremont, & Stokes, 1986), and social skills (Ballard & Jenner, 1981). Moreover, in spite of initial scepticism on the part of many researchers, mentally retarded children have also benefited from correspondence training procedures. For example, it has been employed to teach sharing and praising behaviours in mentally retarded children (Rogers-Warren et al., 1977), posture (Whitman, Scibak, Butler, Richter, & Johnson, 1982). In a comprehensive review of cognitive behavioural interventions with mentally retarded persons, Whitman et al. (1984) noted that the use of cognitive procedures such as correspondence training is increasing. One reason for this may be that the individual is established as the locus of control. This has particular significance for mentally retarded persons who are often viewed as unable to exercise some control over their own behaviour.

There are a number of advantages with correspondence training procedures. Whitman et al. (1982) noted that cognitive strategies may produce longer-lasting behavioural gains than operant learning principles. Correspondence training is believed to enhance generalization because it is difficult for the subject to discriminate when reinforcement will be given. Another advantage is that the training procedure does not interupt the ongoing social interaction of the subjects. Odom and Strain (1986) note that an important consideration when choosing a training procedure for social skills intervention is that the procedure itself does not disrupt the ongoing social exchange. Thus, procedures such as direct social

reinforcement, modeling and instruction are not ideal in play or social situations where disturbances of this nature may interupt and potentially alter the social interaction of the subjects resulting in very brief episodes of interaction. While Odom and Strain (1986) recommend the use of peer intervention stategies it would seem that correspondence training may better avoid the problem of interruption.

There are conflicting views regarding the relative efficacy of the say-do and do-say sequences. Rogers-Warren and Baer (1976) contended that do-say is essentially no different from say-do given that in both cases the subject's verbal behaviour is "intended to affect the next opportunity to perform the corresponding behaviour" (p.336). According to them, the only difference is in the length of time between statement and action. However, Israel and O'Leary (1973), suggested that a say-do sequence would be superior to a do-say sequence for eliciting correspondence since "verbal behaviour is a more readily available and versatile discriminative stimulus than nonverbal behaviour" (p.576). With preschool children, Israel and O'Leary (1973) showed that a say-do sequence produced higher levels of correspondence regarding the choice of play materials than a do-say procedure. In a study which involved practical limitations (Karoly & Dirks, 1977), the length of time with arms outstretched, the say-do sequence produced higher levels of correspondence than the do-say procedure. Karoly and Dirks (1977) suggested that the logic of an intention-execution sequence may facilitate a response set where verbally-stated intentions come to control subsequent performances.

The experiments in this thesis were designed to investigate the effects of antecedent and consequent variables on physical and verbal

sharing. In Experiments 1 to 4, the effects of antecedent variables such as laboratory conditions, familiarity versus novelty of play materials and number of toys were examined. Experiments 5, 6, and 7 involved the investigation of individual versus group contingencies, say-do correspondence training, and do-say correspondence training on sharing and social responses of mentally retarded children. Although a great deal of research has been conducted on the play and sharing behaviour of normal children, there is a paucity of similar research with mentally retarded children. In addition, most of the theories which have been derived from this research pertain to the play and social development of normal children. This is unfortunate given that mentally retarded children often have severe deficits in the areas of play, social, cognitive, verbalization and motor skills. For this reason, they may be in particular need of the learning experiences which play affords.

In all of the present experiments, intervention effects were investigated across a wide range of collateral behaviours. The assessment of both positive and negative collateral behaviours has been neglected by a large number of researchers, despite its obvious importance (see Kazdin, 1982; Schefft & Lehr, 1985). Experiments 6 and 7 evaluated the effects of say-do and do-say correspondence training procedures, respectively. Few researchers have assessed the effects of cognitive behavioural interventions with mentally retarded children despite the recognized suitability of these procedures (see Whitman et al., 1984). Even fewer studies have incorporated moderately mentally retarded children. One reason for this has been that it is doubtful whether cognitive behavioural procedures will be

effective with children who have significant cognitive deficits (Whitman et al., 1982).

EXPERIMENT 1

Investigations of sharing behaviour in children have generally been conducted in the context of the laboratory (e.g., Bar-Tal, Raviv, & Leiser, 1980; Elliott & Vasta, 1970; Fincham, 1978; Fincham & Barling, 1978; Fischer, 1963; Grusec, Kuczynski, Rushton, & Simutis, 1978; Grusec & Redler, 1980; Grusec, Saas-Kortsaak, & Simutis, 1978; Harris, 1971; Midlarsky & Bryan, 1967; Ugurel-Semin, 1952). In a typical experiment, the child participates in a game for which s/he receives prizes. The child can choose whether to keep the winnings or donate them to a charity. Variables such as age, sex, and social class of the subjects, personal characteristics of the models, and demand characteristics have all been studied in this context (Bryan, & Walbek, 1970; Grusec, 1972; Grusec et al., 1978; Rosenhan & White, 1967).

There are a number of reasons for the widespread use of laboratory experiments. First, the laboratory setting allows the experimenter to confine sharing behavior to a discrete, quantifiable response, namely the placing of an object in a box. Second, the influence of extraneous varibles can be minimised. Typically, the child does not see or interact with the person s/he has shared with. Hence, there is no opportunity for the child to be reinforced or otherwise influenced by environmental events. Finally, in a laboratory setting, all subjects are exposed to similar, replicable conditions and have identical resources with which to share.

A number of studies with normal children have indicated that there is a positive correlation between age and willingness to share

(Ugurel-Semin, 1952; Wright, 1942). Bryan (1975) has suggested a number of reasons for this. First, older children may have had more opportunity to learn a norm of social responsibility or a norm dictating equality of resource distribution than younger children. The existing data, however, do not support this suggestion. Two studies have demonstrated the lack of correlation between children's verbal statements about equality in sharing and the actual occurrence of sharing behavior (Bryan & Walbek, 1970; Solomon, Ali, Kfir, Houlihan, & Yaeger, 1972). Second, younger children are too timid to initiate a charitable action in the experimental situation. However, Weissbrod (1974) found that children share more in the presence of a "cold" experimenter. Third, as age increases the worth of the object to be shared decreases. This suggestion has been countered with evidence that there was no difference in degree of liking of winnings in two age groups (Midlarsky & Bryan, 1967). Finally, it has been suggested that older children are more motivated to aid the needy due to their abilty to empathize more with others. Rubin and Schneider (1973) reported data to support this suggestion. They found that children who gained high scores on a test of moral judgement scored low on a measure of egocentrism and shared the most.

In an investigation of sharing with learning disabled children, Fincham (1978) found that learning disabled and normal children shared similar quantities of sweets with a friend. However, when the recipient was an unknown peer the learning disabled group shared significantly fewer sweets. Fincham and Barling (1978) also studied locus of control and sharing in learning disabled, normal, and gifted children. The results indicated that there was a positive correlation

between academic ability and sharing behaviour. Although the studies by Fincham extend the laboratory research findings to a different subject population no research has been reported in which mentally retarded subjects were used.

Experiment 1 assessed the effects of a laboratory procedure on sharing of mentally retarded children. The aim of the experiment was to provide some initial information about sharing in mentally retarded persons in a laboratory setting. Two questions were posed: 1) do retarded children share during a laboratory game? and 2) do variables such as age influence sharing?

METHOD

Participants and Setting

Sixty two boys participated in the experiment. The participants attended junior classes at a residential school for mildly mentally retarded boys. All boys were classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983). The ages of the boys ranged from 9 to 15 years, with a mean of 12.8 years. Etiology of mental retardation was unknown. A number of behaviour problems were prevalent among the participants, including aggression, stereotypy, noncompliance, autistic behaviour, and hyperactivity.

The experiment was conducted in a 4m by 3m research room which was separated from the classrooms and villas by a large playground area. The room was furnished with a table, two chairs, and the research equipment. The latter consisted of a 0.6m by 0.6m screen which divided the table in two, a selection of sweets, two small opaque

boxes, two large cans; one labelled: "MY CAN" and the other with a picture of a thin, poorly dressed boy pasted to it.

Data Collection and Reliability

Data were collected five days a week for a three-week period. Laboratory sessions were held between 9am and 11am. The boys attended one laboratory session each. A female experimenter was responsible for the implementation of the laboratory procedure and the data collection. An event recording method was used to measure sharing behaviour. The experimenter counted the number of times a boy placed a winning in the unknown child's can. The boy's final choice only was counted. Thus, if the boy placed the edible in the poor child's can and then removed it immediately, placing it in his own can, this was recorded as retaining the winning. Any questions or comments which the boys made were also noted.

A second observer was present on 25% of laboratory sessions throughout the experiment in order to assess interobserver reliability and procedural reliability. Interobserver reliability was assessed by dividing the total number of shared winnings counted by the first experimenter, by the total number of shared winnings counted by the reliability observer, and multiplying by 100. In order to assess procedural reliability, the second observer scored the experimenter's verbal and nonverbal behaviours according to a checklist. The checklist contained all the components outlined in the procedures section of this experiment.

Experimental Procedures

Each boy was sent individually to the research room where the experimenter introduced herself, thanked him for attending, and asked him to choose a sweet for himself. Four different types of sweets were available to ensure that each boy chose a preferred type. The sweets were similar in size and shape. The sweet selected by the boy was used as a reward for him throughout the session. The experimenter explained that the boy was about to play a game in which he would have the chance to win more sweets. She pointed to two small boxes and told the participant that she would hide a sweet under one of the boxes. The participant's task was to guess under which box the sweet was hidden. He was told that if he guessed correctly, he could have the sweet. He could then choose whether to keep it for himself by placing it in the can marked "MY CAN" or give it away to a poor child who wouldn't get a chance to play the game by placing it in the can with the picture on the front. (This pictorial representation was for boys who had difficulty reading and therefore could not discriminate between the two cans). The participant was then asked if he understood the procedure. No boy needed to have the procedure explained a second time.

Each boy won on 10 out of a total of 15 trials. The experimenter manipulated winning and losing by placing a sweet under both or neither of the boxes while the screen was up. Following each trial that the boy won, the experimenter reminded him that he could give his sweet to the poor child by placing it in the appropriate can. The experimenter then put the screen up between herself and the participant. This enabled the boy to decide on his own in which can to place the sweet while the experimenter prepared for the next trial.

Trials won or lost were determined on a quasi-random basis, prior to each laboratory session. At the end of the session which lasted approximately 10 minutes, each participant was thanked and sent back to his classroom with the sweet(s) that he had placed in his can. Any sweets in the poor child's can were counted and this information recorded on a separate sheet along with the time, date, boy's name, and comments.

RESULTS

The percentage of interobserver agreement across all reliability sessions was 100%. The experimenters never disagreed on the number of winnings which were placed in the unknown child's can. Assessment of the independent variable showed that in general, the experimenter administered the laboratory sessions without errors. The exceptions were six trials out of a total of 160 trials which were assessed. On all six occasions, the experimenter failed to provide the participant with a verbal prompt to share winnings.

Fifty six of the 62 participants (90%) chose not to share any of their winnings, despite verbal prompts from the experimenter on every winning trial. Table 1 presents information regarding the six boys who did share their winnings. Five of the boys shared five or fewer sweets while the sixth (JB) gave away all his sweets. The boys who shared were from four different classes at school, ranging in age from 11 to 15 years. No participants aged between 9 and 10 years shared their winnings.

Insert Table 1 about here

DISCUSSION

One of the questions addressed by the present study was: do mentally retarded children share during a laboratory game? Only six boys shared their winnings in the laboratory. The other boys failed to share despite repeated verbal prompts from the experimenter to share their winnings with the poor child. From the onset of the game, they placed one hand on the can marked "MY CAN" and without hesitation placed each sweet in the same can. One point which could account for the lack of sharing is that the participants receive sweets from a wide range of people, including teachers, speech therapists, visitors, villa staff, and teacher aides. It is possible that the boys were accustomed to keeping the sweets given to them by adults. However, it does not explain why a minority still chose to share some of their winnings.

The finding that most mentally retarded children do not share during a laboratory game is consistent with the findings of Copobianco and Cole (1960) that a strong relationship exists between mental age and social age. Gunzburg (1965) has argued that the correlation between mental and social age of mentally retarded children is largely due to the failure to train this group in any but the most basic social skills. A number of studies have shown that mentally retarded

Table 1

Number of Sweets Shared During Laboratory Sessions

Participants	Age (years)	Sweets Shared
NW	11	2
RN	12	5
MD	13	3
JB	13	10
VT	14	4
GD	15	4

persons often lack the skills necessary to maintain positive social interactions. It would be interesting to determine whether the present findings are applicable to naturalistic settings. If Gunzburg's theory is correct then there should be a lack of sharing in both settings. However, an alternative argument is that the participants failed to share in the laboratory because they had no previous knowledge or experience with the unknown child. This notion is supported by some anecdotal evidence from the present experiment. The experimenters observed that subsequent to the laboratory game two boys shared their winnings with a close friend although neither had shared in the laboratory session. These observations are consistent with the results reported by Fincham (1978) which showed that learning disabled children were more likely to share with a friend than an unknown peer.

The present study also assessed whether the age of the participant influences sharing. Although there were no clearcut age differences, it appears that older boys (11-15 years) were more likely to share than younger boys (9-10 years). This finding is consistent with previous studies which showed that altruistic acts were correlated with age (Harris, 1971; Midlarsky & Bryan, 1967; Ugurel-Semin, 1952; Wright, 1942). The suggestion that prizes may lose their reinforcement value as children get older might be relevant to the present study as well. However, the number of boys who shared was so small that no firm conclusions can be drawn.

Laboratory procedures have been used extensively by developmental psychologists to examine the conditions in which sharing may occur. These researchers attempt to explain specific findings and how they

relate to existing theories of child development. According to the social learning theory (Bandura, 1969) sharing is learned through the observation of others. This theory adequately accounts for the present findings since it would postulate that the failure of most participants to share would be due to insufficient exposure to models of this behavior and lack of accompanying reinforcement. The fact that many of the boys who participated in this experiment have lived away from home since the age of 6 years may indicate that few appropriate models have been available and hence sharing has not been learnt.

The present study provides some preliminary information on the effects of a laboratory procedure on sharing by mentally retarded children. A number of interesting questions have been raised which require investigation in future research. Of particular interest is the question whether laboratory games accurately reflect the subject's readiness to share with others in his/her immediate environment.

EXPERIMENT 2

Two methods of research have been employed in the study of children's sharing behaviour. The first and most prevalent method involves the use of laboratory experiments. This approach has been favoured by researchers with a background in developmental psychology. Within the laboratory context, research has been conducted on a wide range of variables, including, age, sex, and social class of the subjects, personal characteristics of models, reinforcement, and demand characteristics (see Exp 1). The second approach has been to evaluate and modify sharing behaviour as it occurs in naturalistic settings. This method has been employed by behavioural psychologists in order to develop effective intervention techniques for the facilitation of sharing.

Both the laboratory and naturalistic procedures have distinct advantages associated with their use. The former are considered useful because they enable the precise definition and measurement of sharing behaviour. Within the context of the laboratory, the influence of extraneous variables can be minimised. Subjects are exposed to similar, replicable conditions and possess identical resources with which to share. In contrast, naturalistic settings have the advantage of allowing for real-life assessment and intervention. The naturalistic experiment is often considered to be of more utility due to its immediate relevance and applicability to every day situations whereas laboratory experiments have been criticised for being contrived, artificial, and bearing little relevance to every day human behaviour.

Several research groups have investigated the degree to which behaviour measured in the laboratory is related to other helping behaviours (Mussen, Rutherford, Harris, & Keasey, 1970; Staub & Sherk, 1970). However, the results do not indicate high correlations between various forms of helping. One exception, is the study by Midlarsky and Bryan (1972) which showed that children's sharing in the laboratory predicted their giving in a classroom setting.

In only one study were the effects of laboratory versus classroom settings evaluated on the sharing of children (Hibbard, Barton, Dorcey & Klamfloth, 1982). Hibbard et al. (1982) tested the hypothesis that children who share in one situation will be more likely to share in another. Preschool children from two classrooms were observed for five sessions in the laboratory. Each child participated in a game for which s/he won pieces of gum. The winnings could be kept or shared with a poor children's fund. On the day following each laboratory session, the children were observed individually during freeplay sessions in the classroom. The duration of classroom observations was five minutes, which was approximately the same length as laboratory sessions. The results indicated that sharing in the laboratory and sharing in the classroom were not related. The authors concluded that artificial laboratory sharing and spontaneous classroom sharing should not be considered the same behaviours.

There are several problems with the investigation by Hibbard et al. (1982). First, since only the abstract of the study is available many important procedural details regarding the investigation are lacking. Second, Hibbard et al. failed to collect baseline data on sharing in the classroom and the potential effects of the laboratory

sessions were not measured. In addition, no reliability measures were taken and little is known concerning the data collection procedures.

A problem with research to date is that no studies have been located which have compared the effects of laboratory versus naturalistic procedures with mentally retarded children. Thus, the differential effects of these two procedures with mentally retarded children remain unknown. It has been shown that unlike their non-retarded peers mentally retarded persons are deficient in sharing and social skills. Thus, research conducted with normal children may bear little relevance to mentally retarded individuals.

Despite the widespread use of laboratory and naturalistic experiments, there is a paucity of research which compares naturalistic and laboratory findings with respect to sharing regardless of the population studied. Bryan (1975) commented with regard to sharing that "confidence in the relevance of laboratory findings to other settings remains a matter of faith". In this experiment, the effects of laboratory and naturalistic procedures were compared with respect to sharing. The experiment was designed to provide information on the sharing behaviour of mentally retarded children. An alternating treatments design was used to assess the effects of the two procedures on the behaviour of nine mildly mentally retarded boys. The following questions were asked: 1) Is sharing in the laboratory setting related to sharing in the classroom? 2) Does verbal prompting to share in the laboratory affect the frequency of sharing in the classroom? and 3), Is the laboratory procedure a useful method of assessing sharing in mentally retarded boys?

METHOD

Participants and Setting

Nine boys participated in the experiment. They attended the same junior class at a residential school for mildly mentally retarded boys. All participants had been classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983) and were aged between 9 and 13 years (mean = 10.5 years). One participant received anticonvulsant medication which was kept constant throughout the experiment. Etiology of mental retardation was unknown. A number of behavioural problems were exhibited by the participants including aggression, noncompliance, stereotypy, autistic behaviour, and temper tantrums. Table 2 presents information regarding individual participants. Motor, language, and cognitive problems were scored on a scale from none to severe, which was compiled from teacher records and test reports.

Insert Table 2 about here

Behavioural observations were taken in the 3m x 4m play area of the boys' classroom. A range of toys, namely plastic and wooden blocks, Lego pieces, trucks, a plastic road map, a record player and a train set were available. The boys' teacher was present at all times.

The laboratory sessions were held in a research room (3m x 4m) which was separated from the classrooms by a large playground area. The room contained a table, two chairs, a large screen (0.6m x 0.6m) which divided the table in two, two small opaque boxes, a selection of

Table 2

Descriptive Information About Participants

Name	Age (yrs)	Problems			
		Behaviour	Motor	Language	Cognitive
Chris	9	Aggression, temper tantrums	None	None	None
Derek	10	Shyness, withdrawal	Mod	Severe	Mild
Glen	13	Aggression, noncompliance	Mod	None	Mild
Mark	9	Aggression, noncompliance, swearing	Mod	Severe	Mild
Nigel	10	Aggressive outbursts	None	Mod	Mod
Robert	10	Aggression, noncompliance	None	Mod	Mild
Shane	11	Stereotypy	Mild	Mild	Mild
Tim (1)	12	Autism, stereotypy	None	Mild	Severe
Tim (2)	10	Aggression, noncompliance	None	Mild	None

sweets, and two large cans, one labelled "MY CAN" and the other with the picture of a thin, poorly dressed boy attached to it.

Response Definitions

Eight behaviours were recorded during play sessions in the classroom. One or more behaviours could be recorded per interval.

1. Physical Sharing: When a child allows another to use, take, or borrow a play material which the former was using (e.g., letting another child take a toy, handing a toy to another child, and, two children simultaneously using the same toy).

2. Verbal Sharing - initiation: When a child verbally expresses the wish to share with another child (e.g., asking to share another child's toy, inviting another child to join a play activity, or offering to share a play material with another child).

3. Verbal Sharing - agreement: When a child verbally accepts an invitation to share another child's play materials, or when a child verbally agrees to share his own play materials with another child.

4. Share Refusal: When a child indicates verbally or nonverbally that s/he is unwilling to share (e.g., protesting when another child tries to help, declining invitations to play with another child's toys, or, pushing another child away when s/he tries to share).

5. Grabbing: When one child takes toys off another and the latter expresses his unwillingness.

6. Positive Social: When a child directs positive attention towards another child (e.g., physical affection, positive verbalizations, and smiling). This category does not include eye contact per se.

7. Negative Social: When a child intitiates any negative social interaction (e.g., hitting, swearing, shouting at another child). This category does not include aggressive behavior directed at inanimate objects.

8. Independent Play: When a child is involved in solitary play (i.e., the toy is not being used by another boy concurrently).

Data Collection and Reliability

Classroom sessions. Behavioural observations were taken every weekday, between 9am and 11am. The boys were observed for 15 minutes each in the classroom. The primary observer was a female graduate student. A second observer was present on 25% of observation sessions in order to assess interobserver reliability. An interval recording method was used, with each 15-minute period being divided into 90 10-second intervals and the end of each interval signalled to the observer through earplugs. If a boy left the play area during the observation period, he was asked to return. If he did not comply with this request, he was led back by the observer. The observation session was discontinued until he returned. Observation continued as long as two or more subjects, one of whom was the target child, were present in the play area.

Prior to the experiment, the two observers practised the observation procedures until 85% interobserver agreement was reached on five consecutive sessions. Reliability was calculated on an interval-by-interval basis. Agreements were defined as intervals in which both observers recorded the same behaviour. The percentage of interobserver agreement was calculated for each behaviour category by

dividing the total number of agreements by agreements plus disagreements and multiplying by 100. Interobserver agreement was calculated on a minimum of 25% of observations for each phase.

Laboratory sessions. The laboratory sessions were held between 9am and 11am, Monday to Friday. Each session lasted approximately 15 minutes. The primary observer for the classroom observations was also responsible for the implementation of the laboratory procedure. A second observer was present on 25% of laboratory sessions in order to assess for interobserver and procedural reliability. Interobserver reliability was assessed by dividing the total number of shared winnings counted by the first experimenter by the total number of shared winnings counted by the reliability observer and multiplying by 100. In order to assess for procedural reliability the second observer scored the experimenter's verbal and nonverbal behaviour according to a checklist. The checklist contained all the components outlined in the procedures section (Phase II) of this experiment.

Experimental Design and Procedures

An alternating treatments design (Barlow & Hayes, 1979) was used to compare sharing behavior in the classroom with sharing behaviour in the laboratory.

Phase I. Baseline. During this phase, each boy was observed for 15 minutes per day. Observations were carried out during free-play sessions in the boys' classroom. Phase 1 continued for a total of 12 weekdays. The classroom teacher intervened only when a boy became severely disruptive or aggressive.

Phase II. Following the baseline phase, the classroom and

laboratory sessions were alternated daily. The procedures for classroom sessions were identical to those in Phase I. Each boy was observed ten times in the classroom setting.

For laboratory sessions, the boys were sent individually to the research room, where the experimenter introduced herself, thanked them for coming, and asked them to choose a sweet as a reward. Four types of sweets were made available in order to reduce the possibility that sharing behavior was a function of sweet dislike. The experimenter used the preferred type of sweet throughout the game. The experimenter then explained that the subject was going to play a game for which he could earn more sweets. She pointed to the two small boxes and told the boy that she would hide a sweet under one of the boxes. His task would be to try and guess which box contained the sweet. He was informed that if he guessed correctly, he could have the sweet. He could then choose whether to keep the prize for himself by placing it in the can marked "MY CAN" or give it to a poor child who wouldn't get a chance to play the game, by placing it in the can with the picture on the front. The picture was used so that boys who had difficulty reading would be able to discriminate between the two cans. The subject was then asked if he understood the procedure. No boy needed to have the procedure explained twice.

The game consisted of 15 trials, 10 of which the participant won. The experimenter manipulated winning and losing by placing sweets under both or neither of the boxes while the screen was in place. The order in which trials were won or lost was determined randomly prior to each laboratory session. On each trial that the subject won, the experimenter reminded him that he could give his sweet to the poor

child by placing it in the appropiate can. At this point, the experimenter placed the screen up between herself and the subject. The subject could then choose for himself which can to place the sweet in. Meanwhile, the experimenter prepared for the next trial. At the end of the session, which lasted approximately 15 minutes, each boy was thanked for participating and sent back to his classroom with the sweet(s) he had placed in his can. Any sweets in the poor children's can were counted and this information was recorded. Laboratory sessions were held once daily, between 9am and 11am. Each boy participated 10 times.

Phase III. Behavioural observations continued in this phase but the laboratory sessions ceased. The observation procedures were identical to those used in Phase I. Each participant was observed for 15 minutes, 10 times.

RESULTS

For all phases of the experiment, interobserver agreement ranged from 95% to 100% (mean = 97.2%) across all participants and behaviours. The percentage of interobserver agreement for laboratory sessions was 100%. The observers never disagreed on the number of winnings which were placed in the unknown child's can. Assessment of the independent variable indicated that in seven out of the 230 trials which were assessed, the experimenter failed to provide the participant with a verbal prompt. In addition, there were two instances in which the experimenter forgot to give the participant a choice of sweets. This occurred with two different boys, both of whom

consistently chose the same sweet throughout all laboratory sessions.

Figure 1 shows the percentage of physical sharing and independent play for the nine participants. Table 3 shows the mean percent of play behaviours across phases.

Insert Figure 1 about here

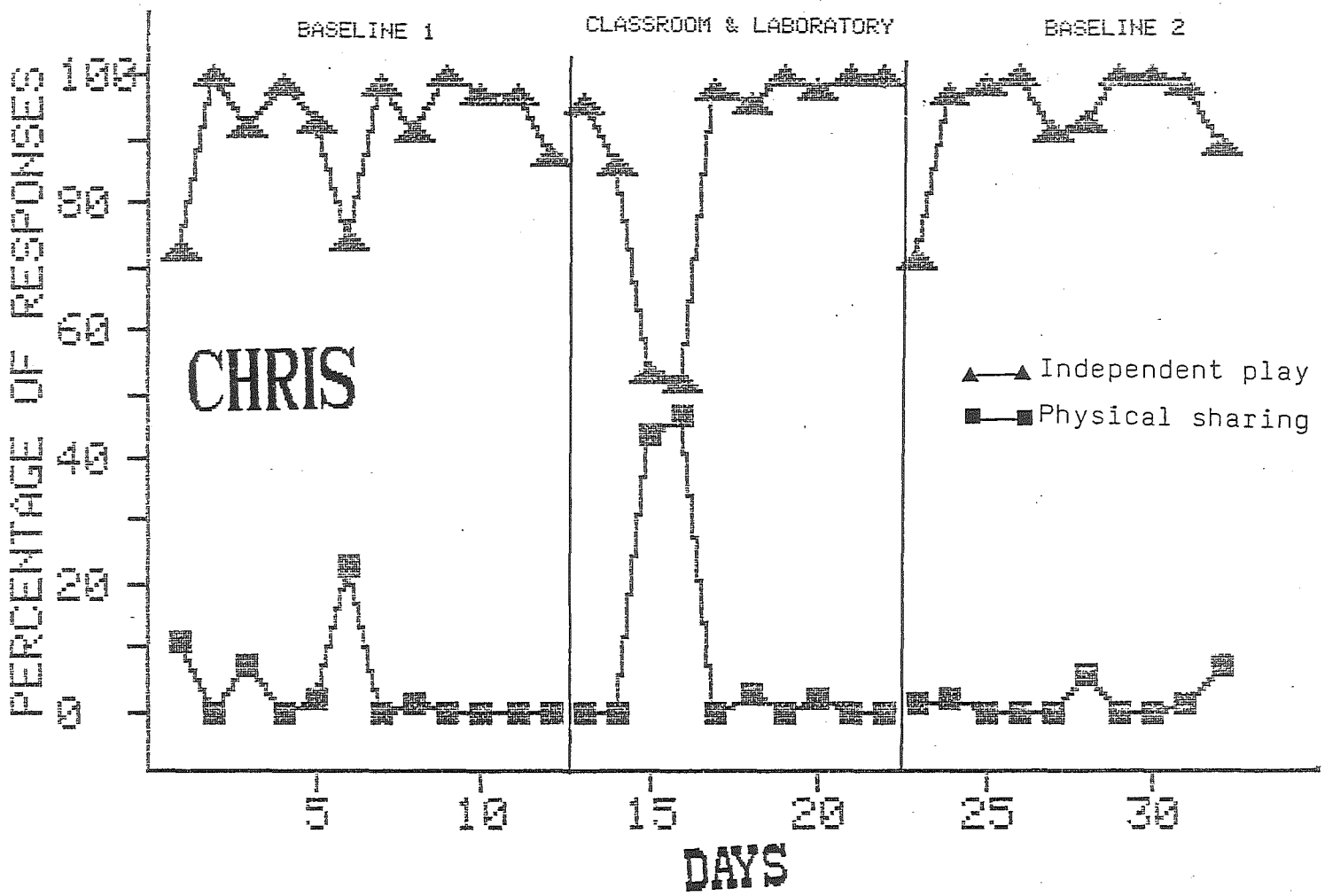
Classroom Observations

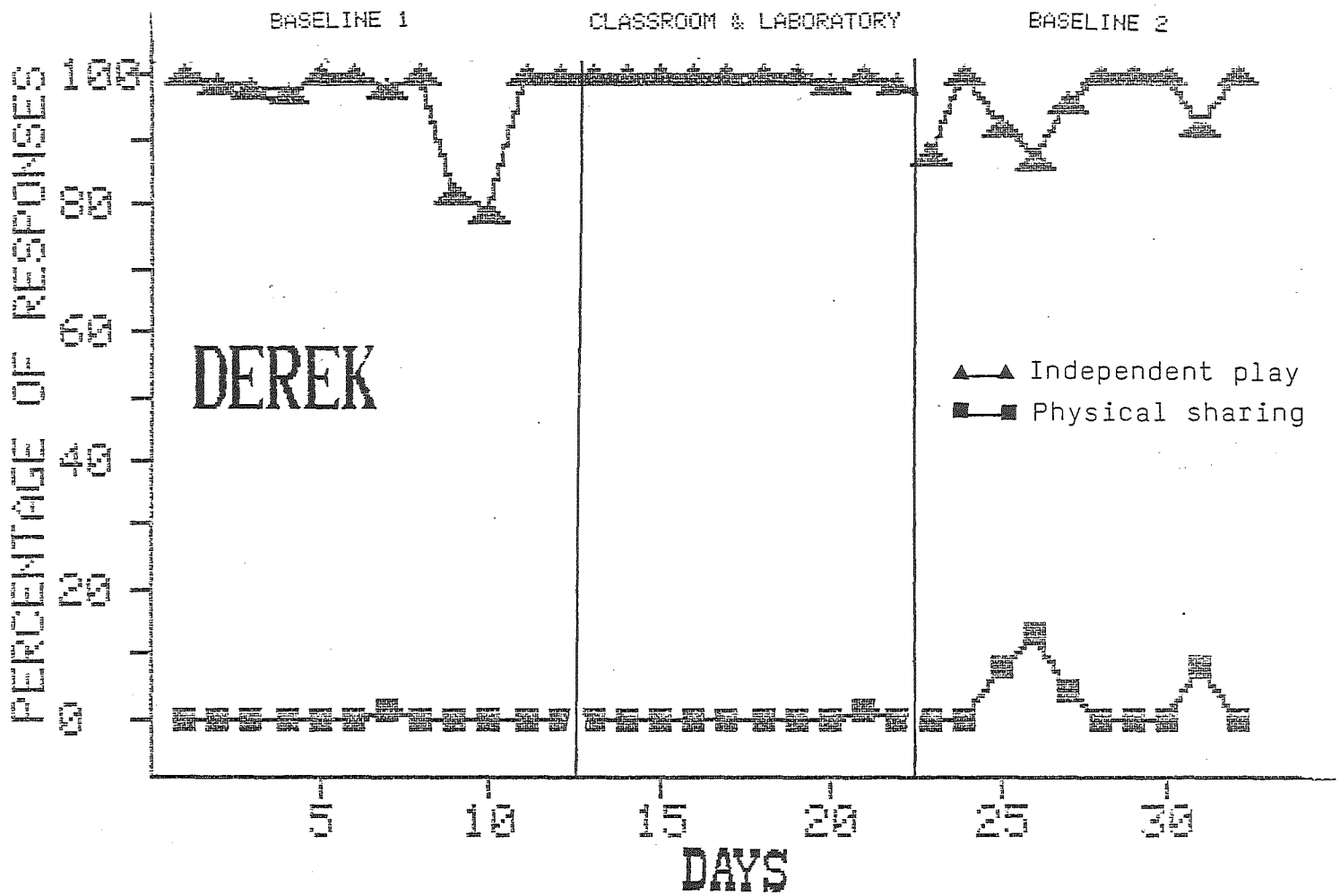
Physical sharing. With few exceptions, physical sharing occurred at low rates throughout the experiment. The highest percentage of physical shares was exhibited by Tim (2) who shared in 64% of intervals in one session during Phase II. Mark and Robert each displayed high rates of sharing during one session. They both shared in 59% of intervals during one baseline session.

For Chris, the percentage of physical sharing remained below 10% across all experimental phases. There were three exceptions. In one baseline session, he shared in 23% of intervals, and for two sessions during Phase II, his percentage of shares was 44 and 47. Derek showed near-zero levels of physical sharing throughout the experiment. The maximum percentage of shares for this boy was 13, which occurred for one session during Phase III. The percentage of sharing responses displayed by Glen was generally near zero. However on three occasions, this behaviour increased to higher levels. During baseline, Glen shared on 16% and 28% of intervals, and during Phase II, he shared on 11% of intervals. Mark shared for 16% and 59% of intervals during two baseline sessions. In all other sessions, the percentage of physical sharing remained near zero. For Nigel, the

Figure Caption

Figure 1. Percent of physical sharing and independent play observed for each subject in the classroom.


BASELINE 1
CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
0
25
50
75
100
CHRIS
Independent play
Physical sharing
5
10
15
20
25
30
DAYS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CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
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DEREK
Independent play
Physical sharing
1
10
15
20
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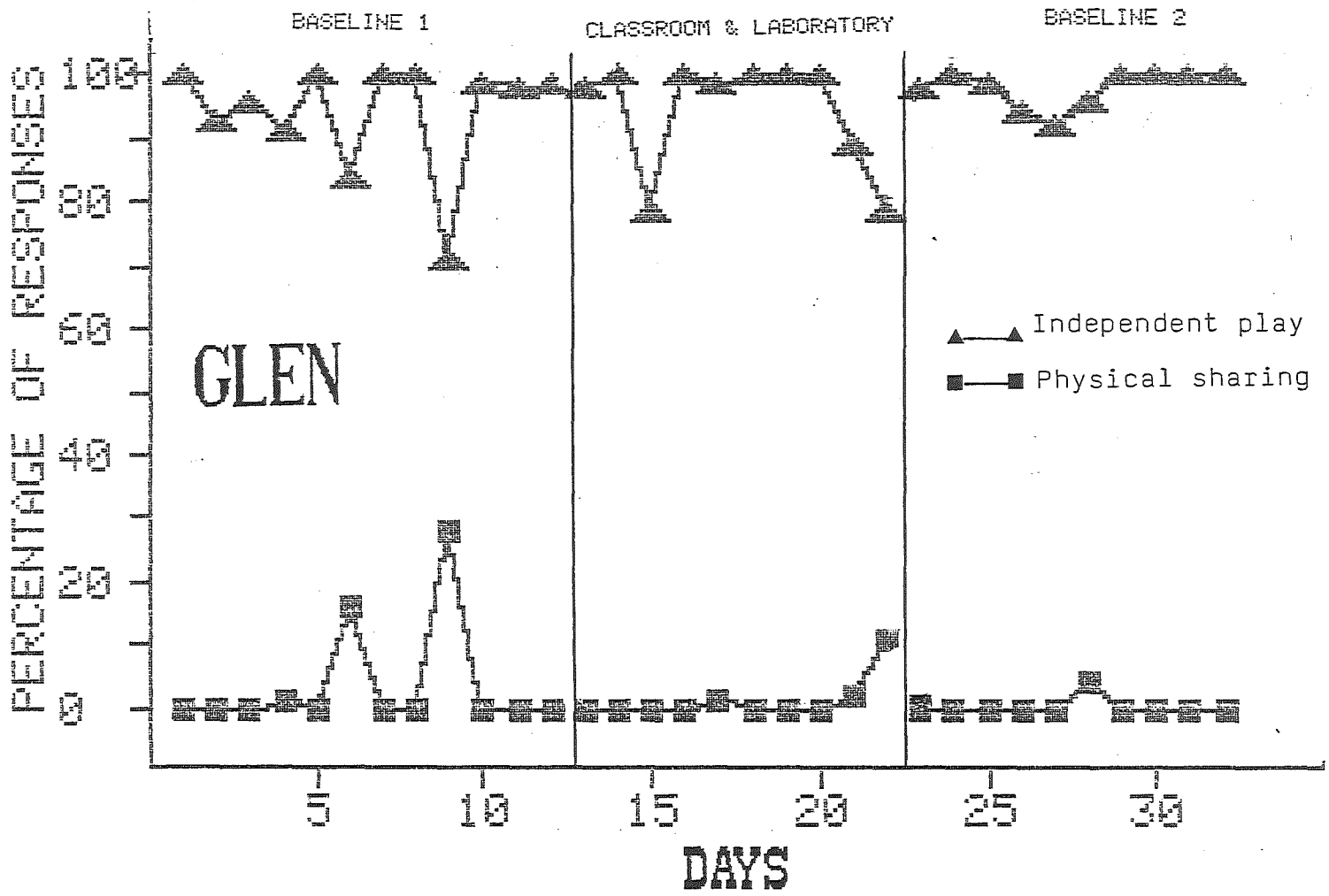
30
DAYS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CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
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40
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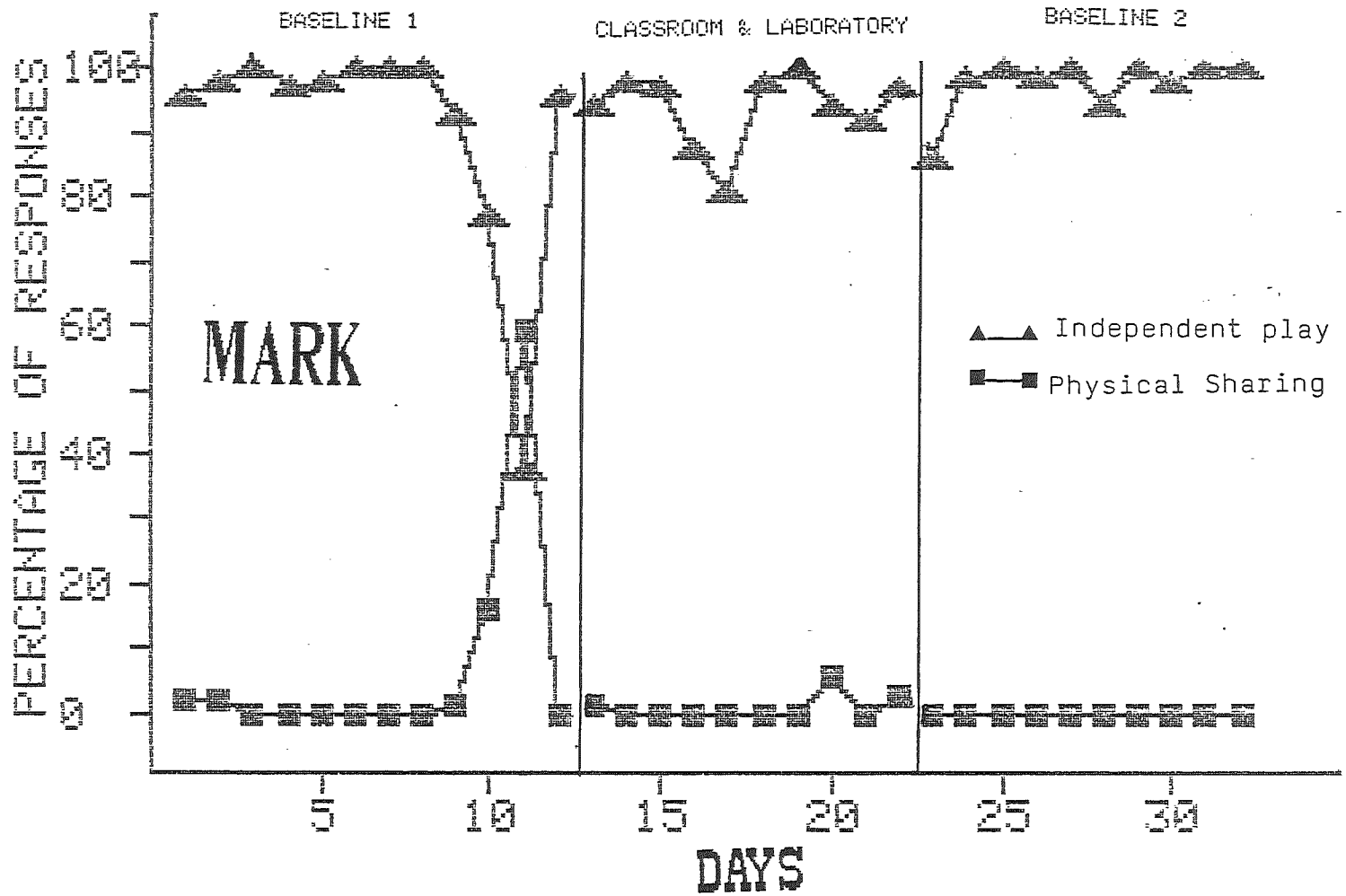
GLEN
Independent play
Physical sharing
5
10
15
20
25
30
DAYS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CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
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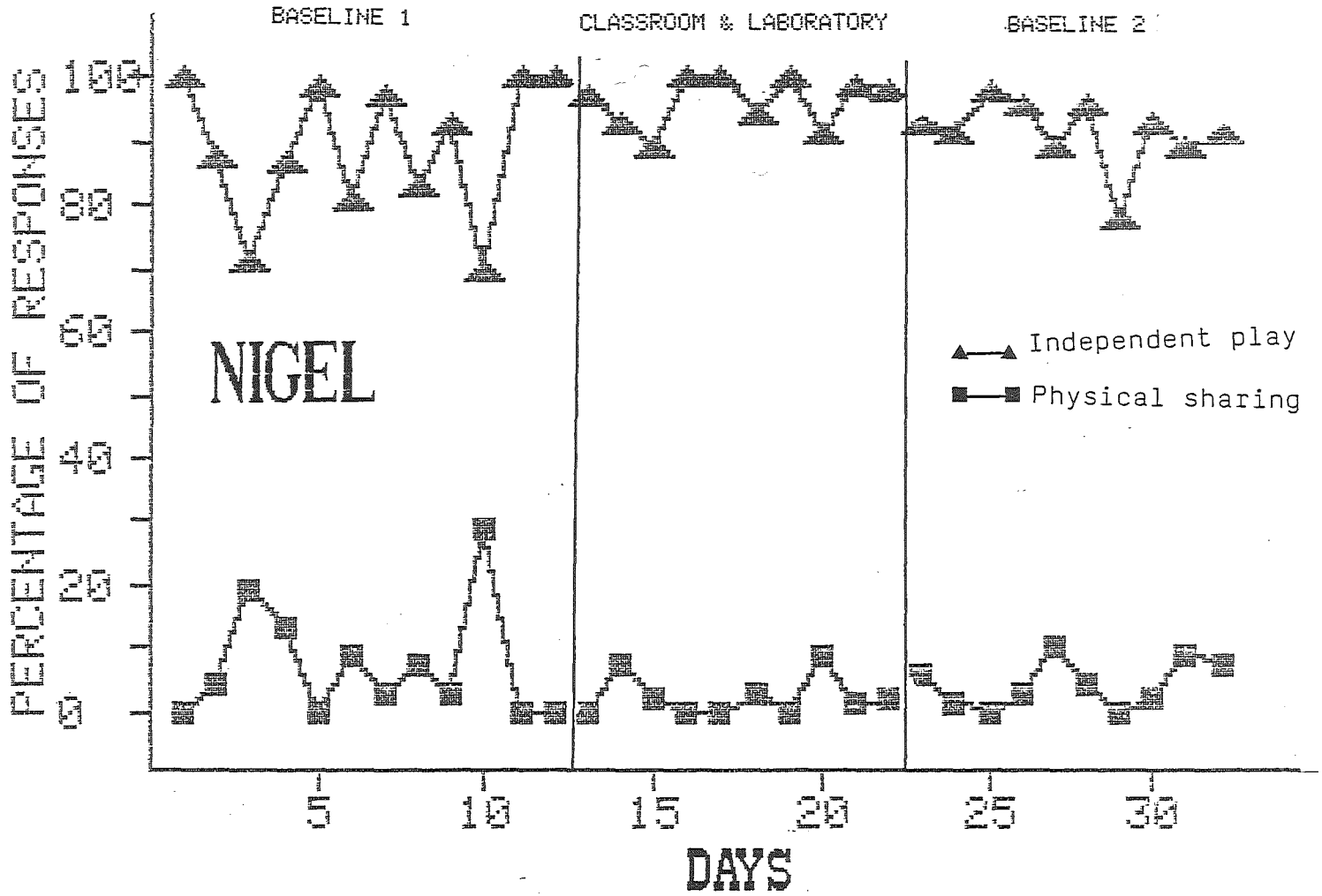
Independent play
Physical Sharing
5
10
15
20
25
30
DAYS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Independent play
Physical sharing
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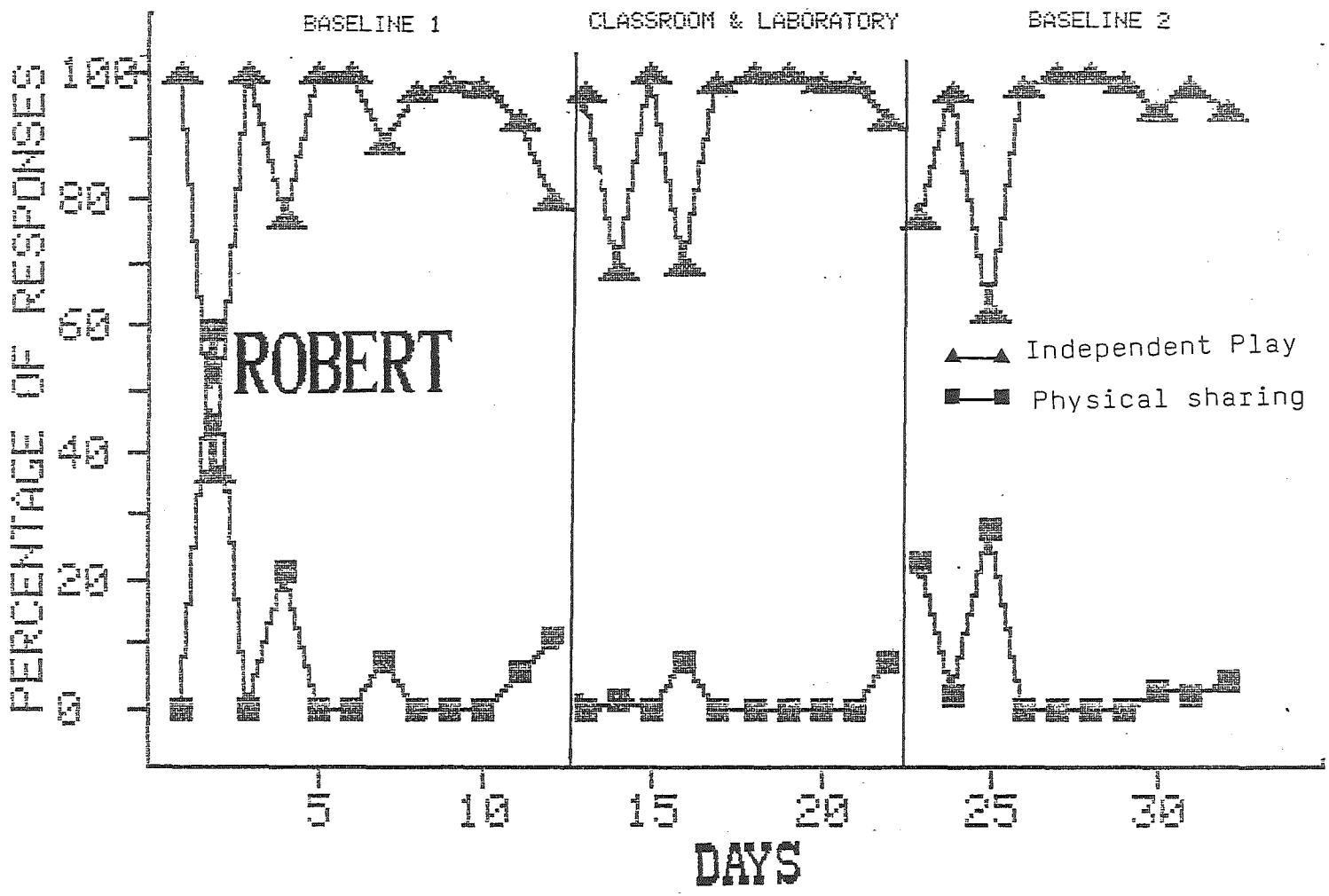
15
20
25
30
DAYS


BASELINE 1
CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
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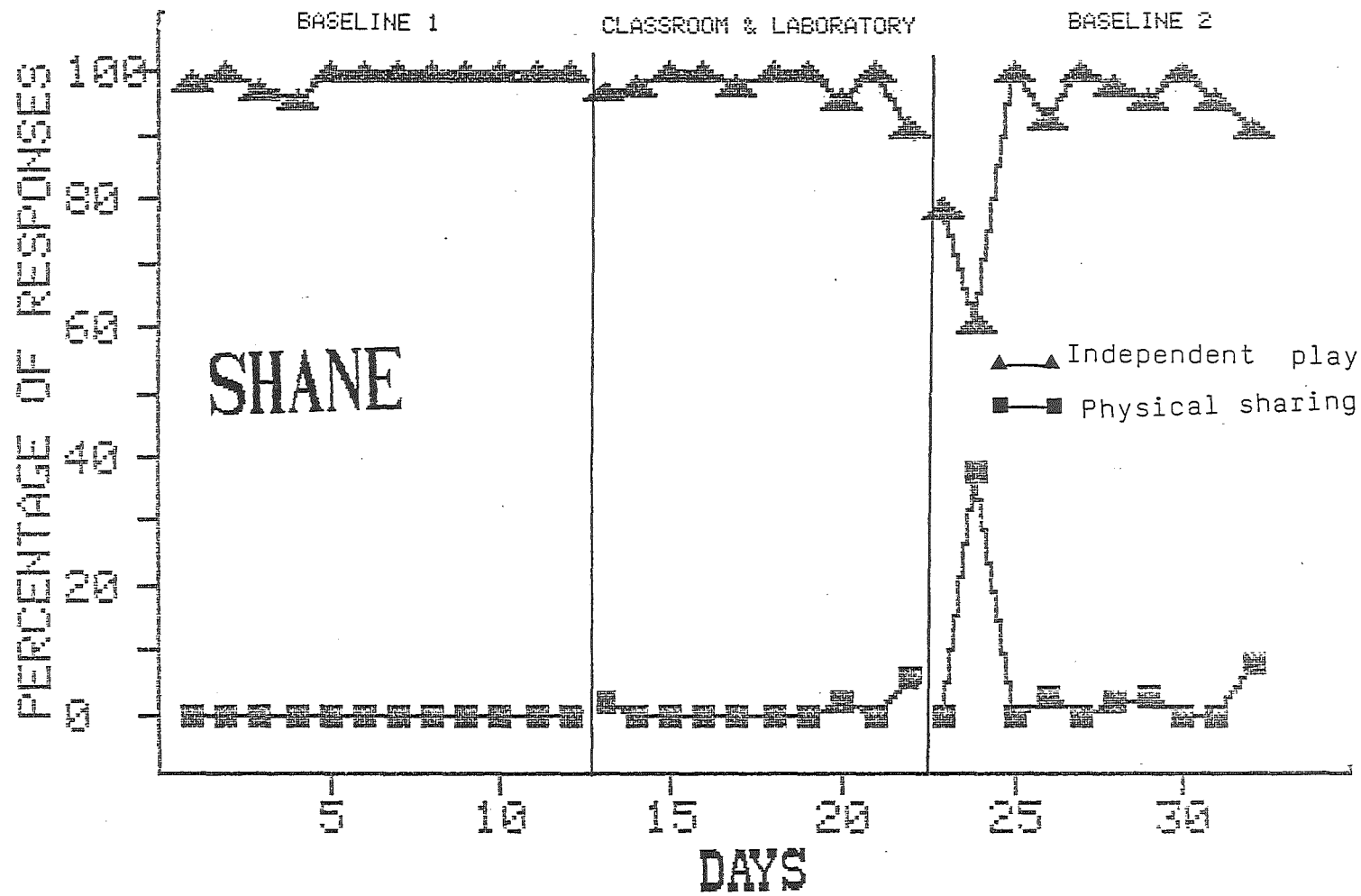
40
60
80
100
ROBERT
Independent Play
Physical sharing
5
10
15
20
25
30
DAYS


BASELINE 1
CLASSROOM & LABORATORY
BASELINE 2
SHANE
Independent play
Physical sharing
PERCENTAGE OF RESPONSES
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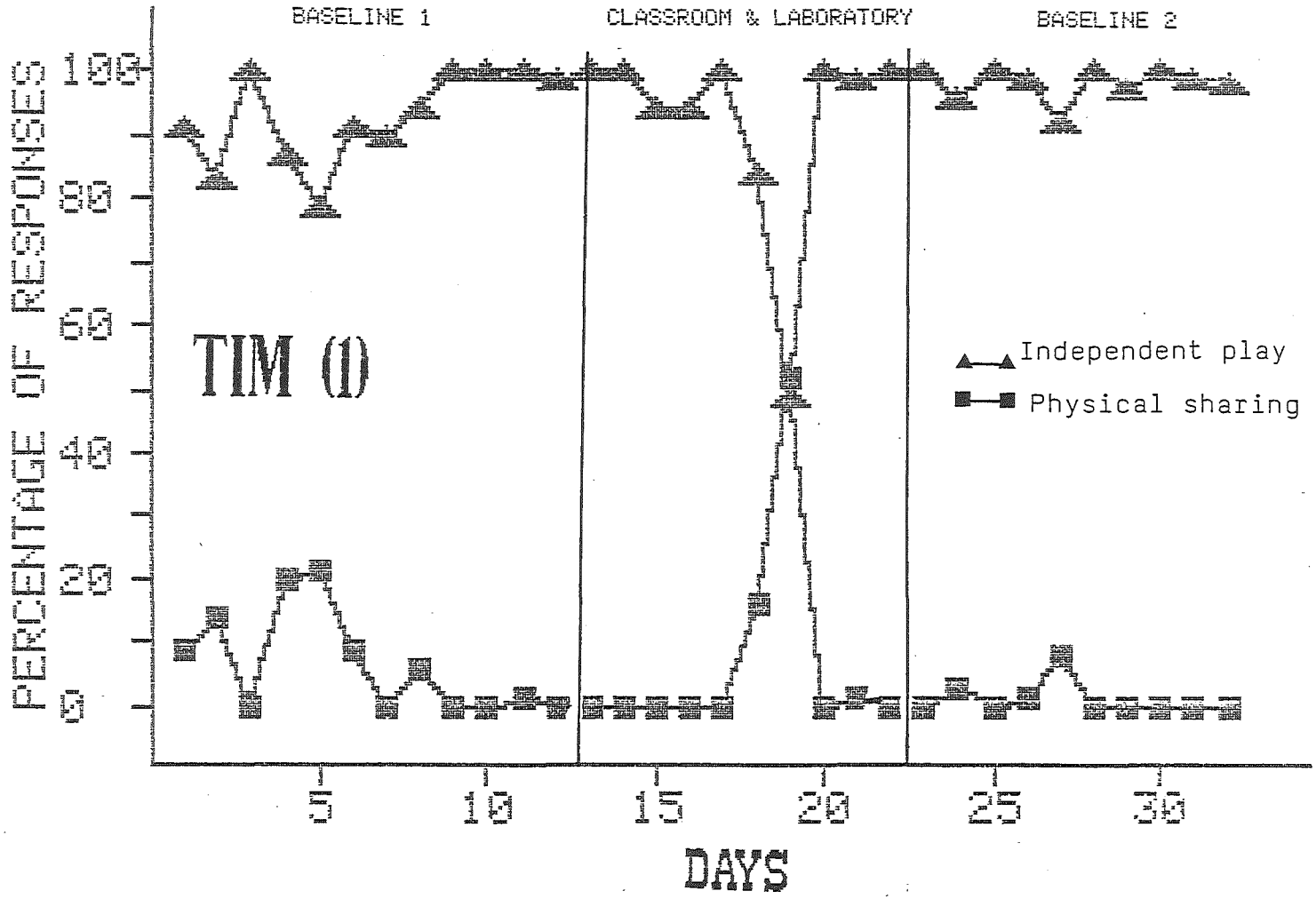
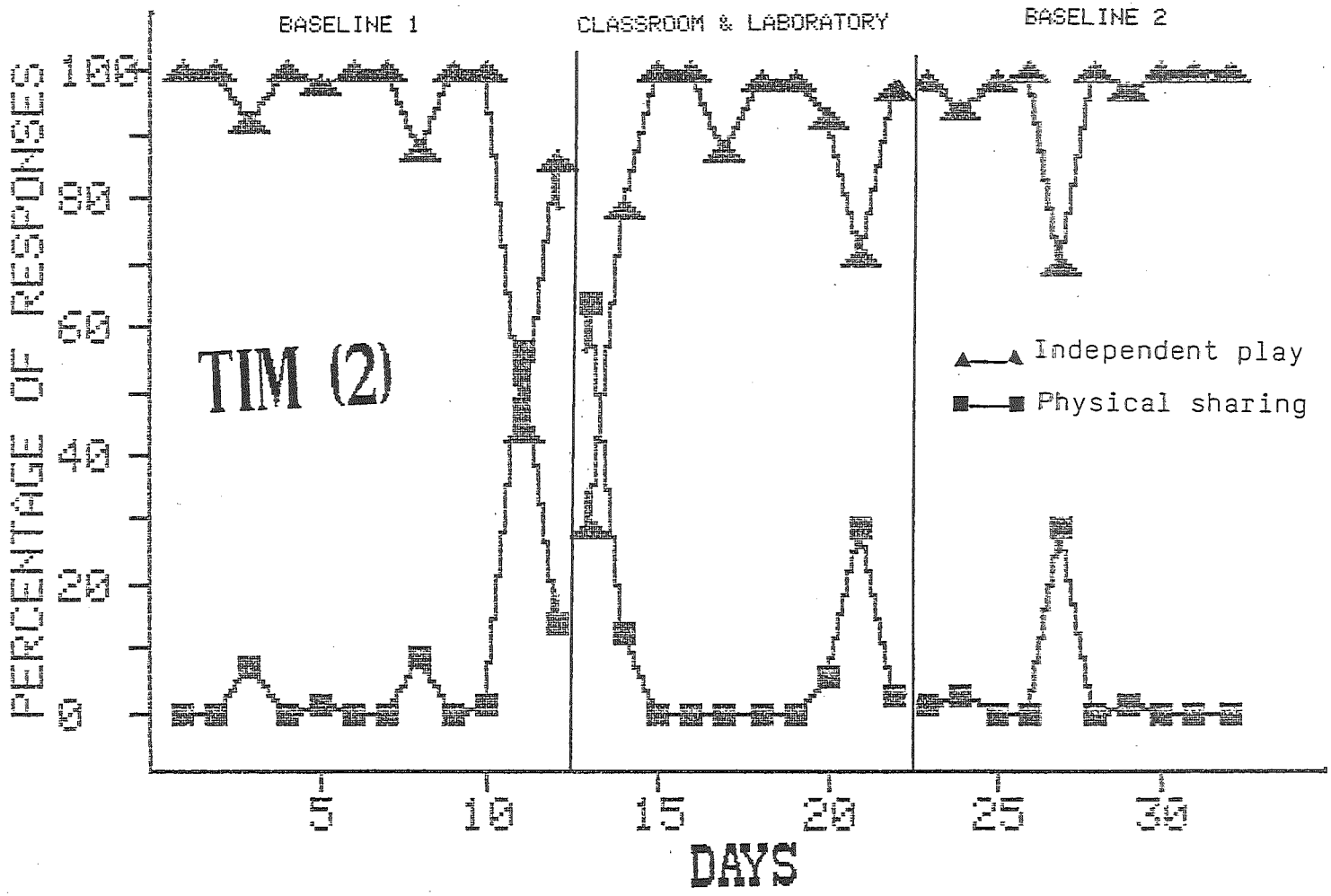
20
40
60
80
100
5
10
15
20
25
30
DAYS


BASELINE 1
CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
0
20
40
60
80
100
TIM (1)
Independent play
Physical sharing
5
10
15
20
25
30
DAYS


BASELINE 1
CLASSROOM & LABORATORY
BASELINE 2
PERCENTAGE OF RESPONSES
0
20
40
60
80
100
TIM (2)
Independent play
Physical sharing
5
10
15
20
25
30
DAYS

highest percent of sharing occurred during baseline, when the percentage of sharing responses was 19 and 29. In all other sessions, sharing remained below 14%. Robert showed the lowest percent of physical sharing during Phase II, when the percentage of responses reached a maximum of 8. During Phase I, Robert shared on 59% and 21% of intervals for two sessions, and in Phase III, the highest level of shares was 28%. Shane exhibited near-zero levels of physical sharing during Phases I and II, but in the final phase, the percentage of sharing responses reached 38 for one session. Tim (1) shared in a maximum of 21% of intervals during Phase I, and a maximum of 52% of intervals in Phase II. During the final phase of the experiment, sharing occurred in less than 8% of intervals. With the exception of six sessions, Tim (2) exhibited near-zero percent of physical sharing across all phases. During Phase I, the highest percentages of sharing were 56 and 14. In Phase II, Tim (2) reached a maximum of 64% sharing responses, with the next highest scores at 29% and 12%. In the final phase, sharing occurred on 29% of intervals for one session.

The mean percent of physical sharing for all participants is presented in Table 3. The data indicate that the mean percent of physical sharing remained below 11.5% across all participants and experimental phases. In general, any differences between means were small and inconsistent.

Insert Table 3 about here

Independent play. This behaviour remained at high levels throughout the experiment. Chris showed the lowest levels of

Table 3

The Mean Percent of Play Behaviours Across Phases in the Classroom

	Physical Sharing	Verbal Init.	Sharing Agree.	Share Refusal	Grabbing	Positive Social	Negative Social	Indep. Play
CHRIS								
Phase 1	3.7	0.3	0.1	0.2	0.4	0.2	2.5	91.9
Phase 2	9.6	0.0	0.0	0.1	0.0	0.0	0.7	87.9
Phase 3	1.7	0.0	0.2	0.4	0.0	0.0	0.0	93.9
DEREK								
Phase 1	0.1	0.1	0.0	0.4	1.0	0.0	2.8	96.1
Phase 2	0.1	0.0	0.0	0.1	0.1	0.0	0.2	99.8
Phase 3	3.3	0.1	0.0	0.2	0.0	0.0	0.0	95.5
GLEN								
Phase 1	3.8	0.0	0.0	0.3	0.1	0.0	1.9	94.3
Phase 2	0.3	0.0	0.0	0.1	0.1	0.0	2.8	94.4
Phase 3	0.4	0.0	0.0	0.0	0.9	0.0	0.5	97.9
MARK								
Phase 1	6.7	0.0	0.0	0.9	0.2	0.1	1.4	91.1
Phase 2	1.0	0.0	0.0	0.6	0.7	0.0	2.3	93.9
Phase 3	0.0	0.0	0.0	0.4	0.2	0.1	0.3	97.6
NIGEL								
Phase 1	7.3	0.2	0.1	0.2	0.9	0.0	2.3	89.1
Phase 2	2.4	0.0	0.0	0.0	0.7	0.0	2.4	96.1
Phase 3	4.2	0.5	0.0	1.1	1.4	0.1	2.3	91.4
ROBERT								
Phase 1	8.7	0.0	0.0	0.0	0.5	0.2	2.0	89.2
Phase 2	1.5	0.0	0.0	0.0	0.3	0.0	1.1	92.6
Phase 3	6.2	0.0	0.1	0.1	0.3	0.0	0.3	91.9
SHANE								
Phase 1	0.0	0.0	0.0	0.0	0.3	0.0	1.3	99.3
Phase 2	1.0	0.0	0.0	0.2	0.1	0.0	0.3	98.0
Phase 3	5.4	0.0	0.0	0.0	1.0	0.0	1.1	91.4
TIM (1)								
Phase 1	6.7	0.0	0.0	0.0	0.2	0.0	1.3	92.8
Phase 2	6.9	0.1	0.0	0.0	0.0	0.0	0.2	92.0
Phase 3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	98.1
TIM (2)								
Phase 1	7.3	0.0	0.0	0.2	0.3	0.1	2.3	92.3
Phase 2	11.4	0.1	0.0	0.0	0.1	0.0	0.4	85.5
Phase 3	3.4	0.3	0.0	0.1	0.0	0.0	0.2	95.9

independent play during Phase II, when the percentage of responses was 52 and 53 for two sessions. For Derek, the percentage of independent play responses remained close to 100% throughout the experiment. The lowest percentage of responses was 79, which occurred during Phase I. Glen engaged in independent play for 71% of intervals during one baseline session. This was the lowest percent of independent play exhibited by Glen. Mark also showed the lowest percentage of independent play during Phase I. For this session, the percentage of responses was 38. Nigel engaged in high but variable rates of independent play throughout the experiment. The lowest percentage of responses was 70, which occurred during Phase I. For Robert, the lowest rate of independent play was 36%. This occurred during Phase I of the experiment. Shane engaged in high levels of independent play during Phases I and II. In the final phase, this behaviour decreased to 61% for one session. Tim (1) showed the lowest percentage of independent play during Phase II, when this behaviour occurred in 49% of intervals during one session. For Tim (2) the lowest percentage of independent play was 29. This occurred during Phase II.

The lowest mean rate of independent play was 85%. Again, changes were minimal and did not reflect any consistent intervention effect.

Verbal Sharing - initiations. Verbal initiations occurred at near-zero levels for all participants. This behaviour occurred at a mean rate of less than 0.6% throughout the experiment.

Verbal Sharing - agreements. Verbal agreements occurred at near-zero levels for all participants. The mean percentage of responses

remained below 0.3 throughout the experiment.

Share Refusal. This behaviour occurred at low rates. The mean percentage of share refusals ranged from 0.0 to 1.1 across all participants and phases.

Grabbing. The mean percent of grabbing varied between 0.0 and 1.4 throughout the experiment. Changes in this behaviour were socially insignificant.

Positive Social Interaction. Positive social interaction occurred at extremely low levels with the highest mean percent for any phase being 0.2%.

Negative Social Interaction. This behaviour occurred at low levels throughout the experiment, with the highest mean percent being 2.8%.

In summary all nine subjects showed mean fluctuations of less than 11% in all behaviors from phase to phase. No marked changes in the data were apparent.

Laboratory sessions

None of the participants donated candy during the sessions in the laboratory. However, it was informally observed that following the laboratory sessions, one of the subjects (Robert) regularly shared his winnings with an older friend who did not participate in the study.

Classroom versus Laboratory Sessions

The data from both classroom and laboratory sessions indicated that the participants seldom engaged in sharing. In the classroom sessions, the mean percentage of physical sharing was 11.4 maximum across all participants. During laboratory sessions, physical sharing remained at zero levels. The use of verbal prompts did not affect sharing in the laboratory or in the classroom. Classroom rates of sharing remained at low but variable levels while laboratory sharing occurred at zero rates. The classroom observatios of sharing provided detailed data on a range of collateral behaviours. In general, these behaviours showed little change following the introduction of laboratory sessions.

DISCUSSION

This experiment addressed the question of whether sharing data obtained in the laboratory setting are applicable to the classroom setting. The results indicate that laboratory sharing and classroom sharing of mildly retarded boys are related in the sense that they both occurred at low levels. However, the classroom data provided information regarding the levels of sharing while the laboratory sessions revealed little. All subjects engaged in some physical sharing in the classroom while there was no sharing of winnings in the laboratory despite frequent verbal prompting.

A number of researchers have compared children's behaviour across different experimental conditions. Hartshorne and May (1928) found only low, though positive, correlations among various types of moral

behaviour. Children were not highly consistent in their behaviour. For example, cheating in one situation was not generally predictive of cheating in another situation. Rutherford and Mussen (1968) tested the hypothesis that generosity is positively related to such characteristics as cooperation, altruism, sympathy, and kindness. Their results showed that children generous in one situation were also generous in another situation. High generosity was also correlated with teacher ratings of gregariousness, kindness, cooperativeness. One study compared sharing in the laboratory with sharing in the classroom (Hibbard, Barton, Dorcey, & Klamfloth, 1982). The results showed that sharing in the laboratory was not related to sharing in the classroom. However, the lack of information regarding actual rates of sharing precludes an indepth comparison of Hibbard et al.'s investigation with the present experiment.

The verbal prompts which were provided during the laboratory game, had no effect on sharing in the laboratory or in the classroom. This finding is interesting in the light of previous research on prompting. While the majority of researchers have employed prompting procedures in combination with other methods such as modeling and reinforcement there are several studies which have evaluated the use of this procedure on its own. Strain and Wiegerink (1976) investigated the effects of verbally prompting children to assume the role of story characters. The data showed that the prompting procedure substantially increased social play of the subjects. Barton (1981) evaluated the use of six behavioural techniques for facilitating sharing in preschool children. The data indicated that neither instructions or instructions plus modeling produced increases in

sharing. With the addition of rehearsal, prompts, and praise, sharing was greatly enhanced. However, this study investigated cumulative effects only, thus the positive effects of later training components may be due to an overlap effect rather than individual components. Although Barton's study was conducted with normal children who, it might be argued, are more receptive to instructions and modeling effects, these children did not show increased rates of sharing. Barton's results are consistent with those of the present experiment which indicated that verbal prompting did not influence sharing in the laboratory setting nor was there any generalization of sharing to the classroom setting. These findings suggest that the use of verbal instructions or prompts alone is not sufficient to increase sharing responses in children. The fact that the participants in the present experiment were mentally retarded might explain their failure to respond to verbal prompts which necessitate considerable understanding of the meaning and intent behind them.

Verbal sharing, both agreements and asking to share, occurred at extremely low levels for all participants throughout the experiment. One reason for this could be that several subjects had speech impediments or limited verbal repertoires. Independent play occurred at high levels throughout the study. This finding is consistent with other studies of mentally retarded children which indicated that baseline rates of sharing are low (Bryant & Budd, 1984).

The laboratory setting provided little information concerning the capacity of each child to share. It appeared to be a less sensitive measure of daily fluctuations in the sharing behavior of mentally retarded boys. In contrast, the classroom observations provided data

on the ability of the subjects to share with their peers. Further, specific areas (e.g., verbal sharing) where deficits were marked could be identified. Despite the obvious advantages of the laboratory setting it is recommended that researchers interested in the study of sharing or cooperative behavior use behavioral observations to provide in-depth information on this topic. Further research is necessary to examine procedures for increasing sharing in the naturalistic setting. In effect, it is not of crucial importance that retarded children learn to share in laboratory settings but the ability to cooperate and share in everyday situations is desirable.

EXPERIMENT 3

Educators and researchers alike have recognized the importance of appropriate play materials as a means of facilitating sharing and social interaction in children. As early as 1934, Kawin suggested that the provision of certain play materials might promote cooperation and social play. While this notion has gained considerable popularity there are few empirical findings to support it. In addition, there is a general lack of information regarding the possible effects of play materials.

In those studies which have involved the use of play materials researchers have often failed to provide specific details concerning the materials employed (e.g., Cooke & Apolloni, 1976; Jason et al. 1980). The type of play material used has varied considerably across experiments, from art materials (Jason, et al., 1980; Robson et al., 1980; Rogers-Warren & Baer, 1976; Rogers-Warren et al., 1977; Warren et al., 1976) and games (Quilitch & Risley, 1973) to more conventional forms of toys (Barton, 1981; Barton & Ascione, 1979; Barton, Olszewski, & Madsen, 1979; Barton & Osborne, 1978; Cooke & Apolloni, 1976; Peck et al., 1978).

Researchers have also differed with respect to the choice of familiar versus novel toys, the availability of play materials, the use of single and/or multiple toys, and rotation variables. The majority of sharing studies have involved the use of a combination of single and multiple toys. In some studies the toys were rotated and in others, the same toys were provided throughout the experiment (see

Barton, 1982). The fact that variables relating to the physical properties and the presentation of play materials have not been held constant across studies has prevented between-study comparisons and has limited the empirical findings on the effects of play materials.

Several studies have evaluated the effects of toy availability on independent play. Jones et al. (1984) assessed material availability and subjects' interactions with play materials. They reported that empirically based toy selection and environmental engineering to ensure convenient and constant material availability increased active engagement with toys by nonambulatory multihandicapped persons. Reid et al. (1978) showed that the availability of recreational resources led to significant increases in appropriate leisure behaviour in physically disabled, mentally retarded persons. Similarly, Wehman (1978) found that toy proximity resulted in high levels of independent play in severely and profoundly handicapped subjects.

More relevant to the present experiment is the evaluation of the novelty/familiarity dimension of play materials. Rabinowitz, Moely, and Finkel (1975) showed that when toys are provided for long periods of time children engage in less play with these toys as time progresses. Thus, familiarity with the toys may result in fewer interactions on the part of subjects. Berlyne (1966) reported similar findings with animals, showing that animals spend more time exploring novel stimuli than they do familiar stimuli. Corter and Jamieson (1977) found that infants prefer novel toys to familiar toys and that they play for longer periods with novel toys. Bambara, Spiegel-McGill, Shores, and Fox (1984) compared the effects of reactive and nonreactive toys on toy manipulation and visual attention of severely

handicapped children. The results indicated that reactive toys elicited more manipulative activity than nonreactive toys. A related study by Quilitch, Christopherson, and Risley (1977) found that having multiples of popular toys did not produce much more use of the toys than having just one of each. In general, these studies suggest that independent toy play can be increased by manipulating various stimulus characteristics of toys (e.g., availability, reactivity, and novelty).

There is a paucity of research which has investigated the effects of toys on children's social behaviour. Hulson (1930) assessed the effects of different play materials on social play of normal four-year old children. Social play was defined as multiple child use of a play material. The data indicated that wooden blocks, a dolls' house, sand piles, and a see-saw produced more social play than other toys. Van Alstyne (1932) evaluated the social utility of toys by recording conversations and instances of active and passive cooperation between children using a group of toys. Children most frequently played together around such toys as a wagon, dishes, blocks, doll house, and dump trucks. Hulson (1930) and Van Alstyne (1932) reported that clay and plasticine are low in social value. Updegraff and Herbst (1933) assessed the effects of blocks versus clay on the behaviour of two- and three-year old children. In contrast to the findings of Hulson (1930) and Van Alstyne (1932), they found that social behaviour and cooperation occurred more frequently with clay materials. However, there was little difference in the amount of conversation with the two play materials. Beckman and Kohl (1984) investigated the effects of social and isolate toys on play behaviours of preschool children, some of whom were mentally retarded. The results showed that when only

social toys were available, the children interacted more with each other and toy play occurred less often.

In a similar study, Quilitch and Risley (1973) compared toys which were specifically designed for independent play with toys designed for social play. They found that normal children engaged in social play for only 16% of the time when "isolate" toys were provided, and 78% of the time when "social" toys were provided. Hendrickson, Strain, Tremblay, and Shores (1981) also showed that certain types of play materials differentially affect the play and social responses of normal children. In a related study by Zinser and Lydiatt (1976), children were asked to share high- and low-value candy with poor and rich recipients. The results indicated that the subjects shared more of their low-value candy.

Studies investigating the effects of play materials on social behaviour have indicated that social toys will elicit more sharing than isolate toys. However, the majority of researchers have used normal children as subjects. In addition, no studies could be located which investigated the effects of novel versus familiar toys on children's sharing or social behaviour. Further research is necessary to determine the effects of these toys with mentally retarded children. It may be that those toys which have been designated as social toys for normal children, do not produce social behaviour in mentally retarded children. For example, they may not play with complex games because they have not been taught how to use them.

The present experiment was designed to assess the effects of familiar versus novel play materials on sharing and collateral behaviours of mentally retarded children. One goal of this research

was to extend previous research findings which have been restricted to normal children. The experiment incorporates strong design methodology to evaluate the effects of play materials.

METHOD

Participants and Setting

Four boys participated in this experiment. They attended the same junior class at a residential school for mildly mentally retarded boys. All participants had been classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983) and were aged between 10 and 12 years (mean = 10.8). One boy received anticonvulsant medication which was kept constant throughout the experiment. Etiology of mental retardation was unknown. The participants exhibited various behavioural excesses and/or deficits including stereotypy, withdrawal, aggression, and autistic behaviour. Table 4 presents information regarding individual participants. Motor, language, and cognitive problems were scored on a scale from none to severe, which was compiled from teacher records and test reports.

Insert Table 4 about here

Observations were taken in a 3m x 4m play area in the boys' classroom. The four participants were the only children present in the classroom during observation sessions. Two sets of play materials were compared during the experiment. Both sets comprised of single-

Table 4

Descriptive Information About Participants

Name	Age (yrs)	Problems			
		Behaviour	Motor	Language	Cognitive
Derek	10	Shyness, withdrawal	Mod	Severe	Mild
Nigel	10	Aggressive outbursts	None	Mod	Mod
Shane	11	Stereotypy	Mild	Mild	Mild
Tim	12	Autism, stereotypy	None	Mild	Severe

item and multi-component toys. The play materials in Set 1 consisted of toys which belonged to the classroom and which were freely available on all weekdays during classroom freeplay times. These materials consisted of 20 wooden and 20 Lego blocks, a train set (train carriages, engine, railroad tracks), four plastic people, a service station (involving a wooden service station, petrol pumps, a ramp, and mechanics tools), two cars, two trucks, and a play road. Set 2 involved a large pool of novel block sets and play sets. Two block sets and two play sets were available during three consecutive observation sessions before another four sets were chosen. The block sets involved 20 bristle blocks, 20 wooden slot-together blocks, 20 wooden blocks of different shapes and sizes, 20 Duplo blocks, and 20 large plastic bricks which fitted together. The play sets consisted of: 1) a farmhouse set (involving a house, furniture, two cars, two jeeps, four model people), 2) a car-park building set (including a three-storey building, four cars, a rotating circle, and a car lift), 3) a farmyard set (involving fences, farm animals, barns, and two tractors, two motor bikes), 4) a car rally set (with racing cars, racing circuit, ramps, and road signs), 5) a cash register (with play money, grocery items, and a shop counter), 6) a hand puppet set (consisting of three animals, a pirate, a magician, and a sailor), 7) a truck set (involving two large trucks with trailers, two vans, a range of logs, cartons, barrels, furniture), and 8) a hospital set (with a hospital building, two ambulances, two patrol cars, stretchers, and model people).

Response Definitions

Nine behaviours were recorded during play sessions in the classroom. One or more behaviours could be recorded per interval. Inactivity could only be scored when no other behaviour occurred during an interval.

1. Physical sharing: When a child allows another to use, take, or borrow a play material which the former was using (e.g., letting another child take a toy, handing a toy to another child and two children simultaneously using the same toy).

2. Verbal sharing, initiation: When a child verbally expresses the wish to share with another child (e.g., asking to share another child's toy, inviting another child to join a play activity or offering to share a play material with another child).

3. Verbal sharing, agreement: When a child verbally accepts an invitation to share another child's play materials or when a child verbally agrees to share his own play materials with another child.

4. Share refusal: When a child indicates verbally or nonverbally that s/he is unwilling to share (e.g., protesting when another child tries to help, declining invitations to play with another child's toys, or, pushing another child away when s/he tries to share).

5. Grabbing: When one child takes toys off another and the latter expresses his unwillingness.

6. Positive social: When a child directs positive attention towards another child (e.g., physical affection, positive verbalizations, and smiling). This category does not include eye contact per se.

7. Negative social: When a child intitiates any negative social interaction (e.g., hitting, swearing, shouting at another child). This category does not include aggressive behavior directed at inanimate objects.

8. Independent play: When a child is involved in solitary play (i.e., the toy is not being used by another boy concurrently).

9. Inactivity: When a child is not engaged in any purposeful activity during an observation interval (e.g., staring into space, lying on the floor without moving).

Data Collection and Reliability

Behavioural observations were taken every weekday, between 10am and 11am. An interval recording method was used with each 20 minute observation session divided into 120 10-second intervals. The end of each interval was signalled to the observer through earplugs. The boys were observed in rotated order. Thus, in the first 10 sec interval the observer would code the behaviour of the first subject, the behaviour of the second subject in the second interval, and so on. The order in which the participants were observed was randomly determined and remained fixed throughout the experiment. If a boy left the play area during the observation session, he was asked to return. If he did not comply with this request, he was led back to the play area by the observer. Observations were taken only when all four participants were present in the play area.

The author served as the primary observer in the experiment. A second observer was present on 25% of observation sessions in order to

assess interobserver reliability. Prior to the experiment, the observers practised the observation procedures until 85% interobserver agreement was reached on five consecutive sessions. Reliability was calculated on an interval-by-interval basis. Agreements occurred when both observers recorded the same behaviour in the same interval. The percentage of interobserver agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements, and multiplying by 100. Interobserver agreement was assessed on 25% of sessions across all experimental phases.

Experimental Design and Procedures

An alternating treatments design (Barlow & Hayes, 1979) was used to evaluate the effects of familiar versus novel play materials.

Phase I. During this phase, two 20-minute observation sessions were carried out daily in the classroom play area. The familiar play materials (Set 1) were provided during all baseline sessions. Phase 1 continued for nine sessions.

Phase II. Following the baseline phase, the familiar toys condition and novel toys condition were presented daily in a randomized order. The observation procedures were identical to those in Phase I. Phase II continued for 30 sessions (i.e., 15 sessions for each condition).

Phase III. This phase was identical to Phase I. Familiar toys were provided throughout. Phase III lasted for a total of seven sessions.

RESULTS

Interobserver agreement ranged from 96% to 100% across all participants and behaviours. The mean percentage agreement was 99.6%.

Figure 2 shows the percentage of sharing responses for the four participants. Table 5 shows the mean percent of play behaviours across phases.

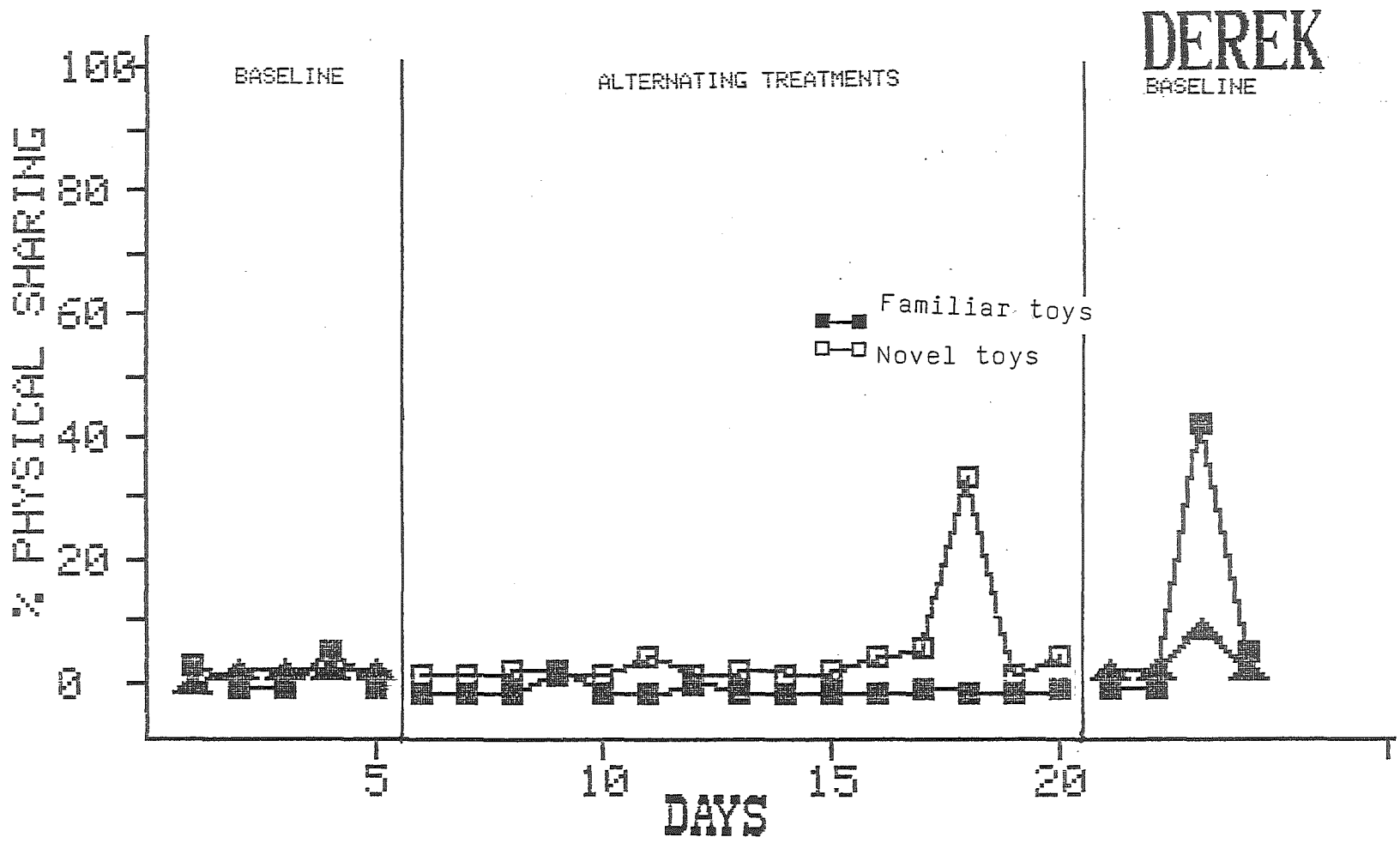
Insert Figure 2 about here

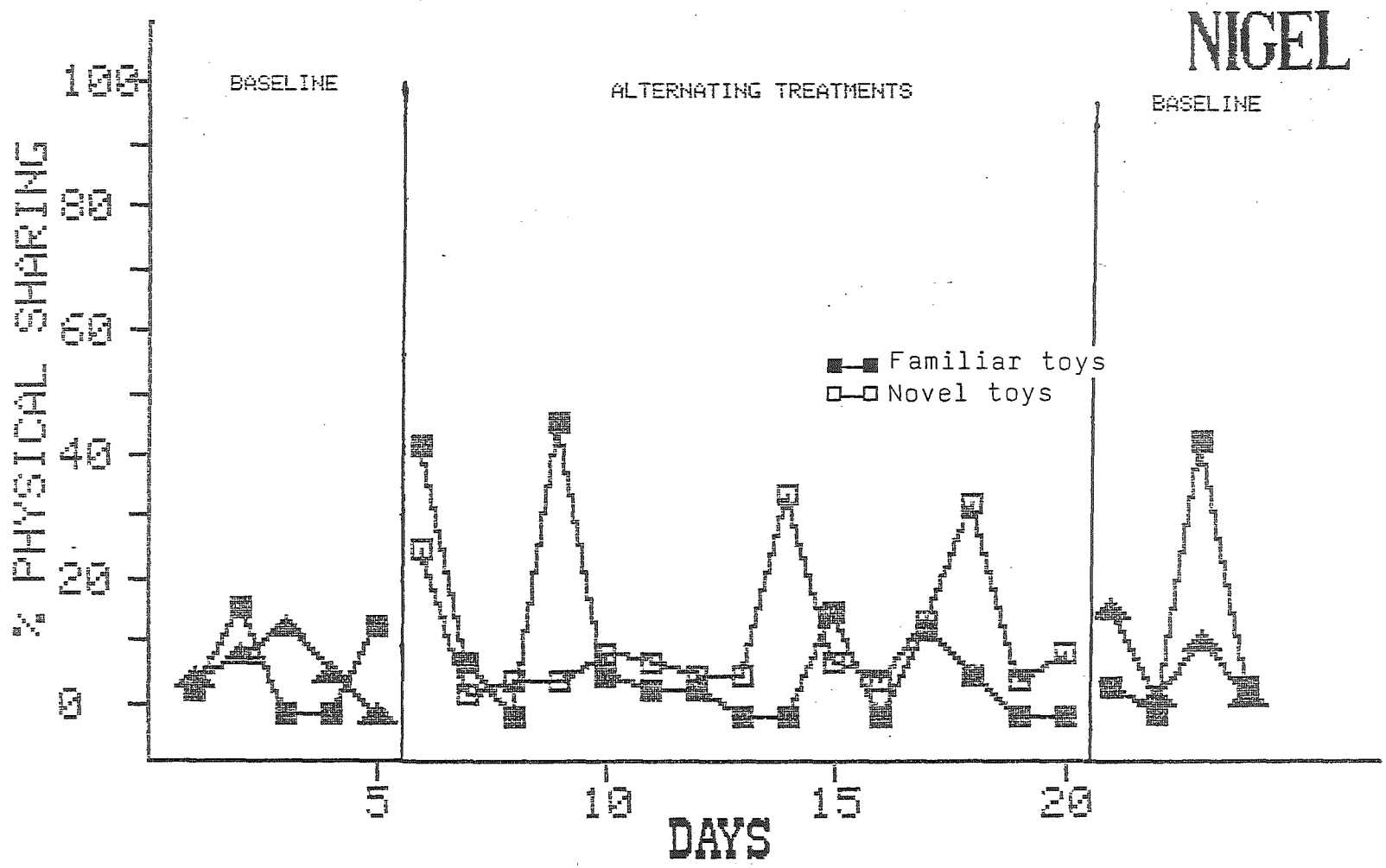
Physical Sharing

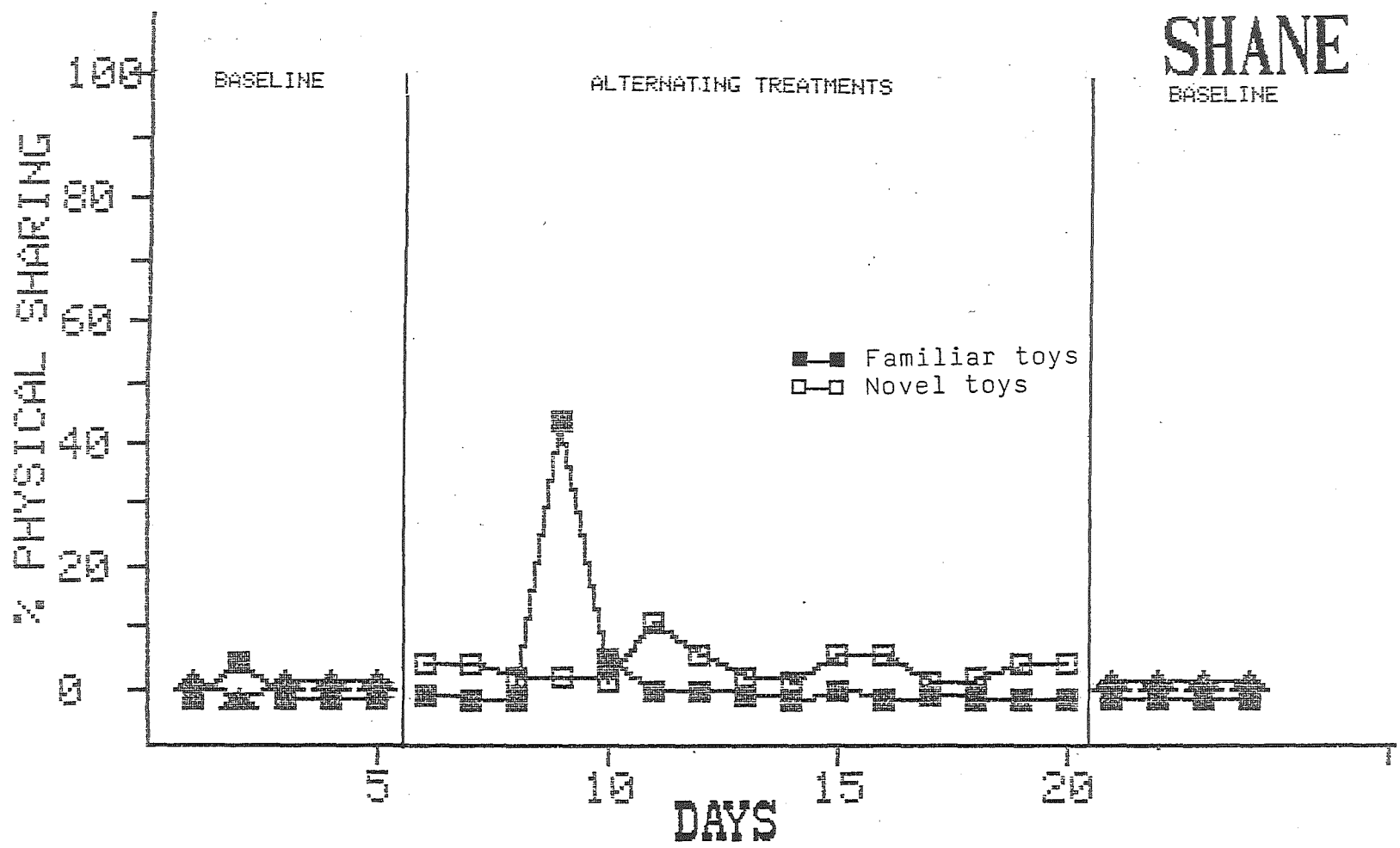
This behaviour occurred at low rates throughout the experiment, with the mean percent of responses ranging from 0.4 to 11.1 (see Table 5). For Derek, the percent of physical shares remained close to zero across all conditions. There were three exceptions. During the alternating treatments phase, physical sharing occurred in 33% of intervals for one session in which novel toys were available. In Phase III, sharing increased to 43% during one session and to 10% in another session. Nigel showed variable levels of physical sharing across all experimental conditions. In Baseline 1, the percentage of shares ranged from 0% to 17%. During the alternating treatments phase, the percentage of sharing responses reached a maximum of 48 during a session in which familiar toys were provided. In general, levels of sharing were similar for both the familiar and novel toy conditions. In Phase III, sharing occurred at low levels, with the exception of one session when the percentage of sharing responses was 43. Shane engaged in low rates of physical sharing throughout the

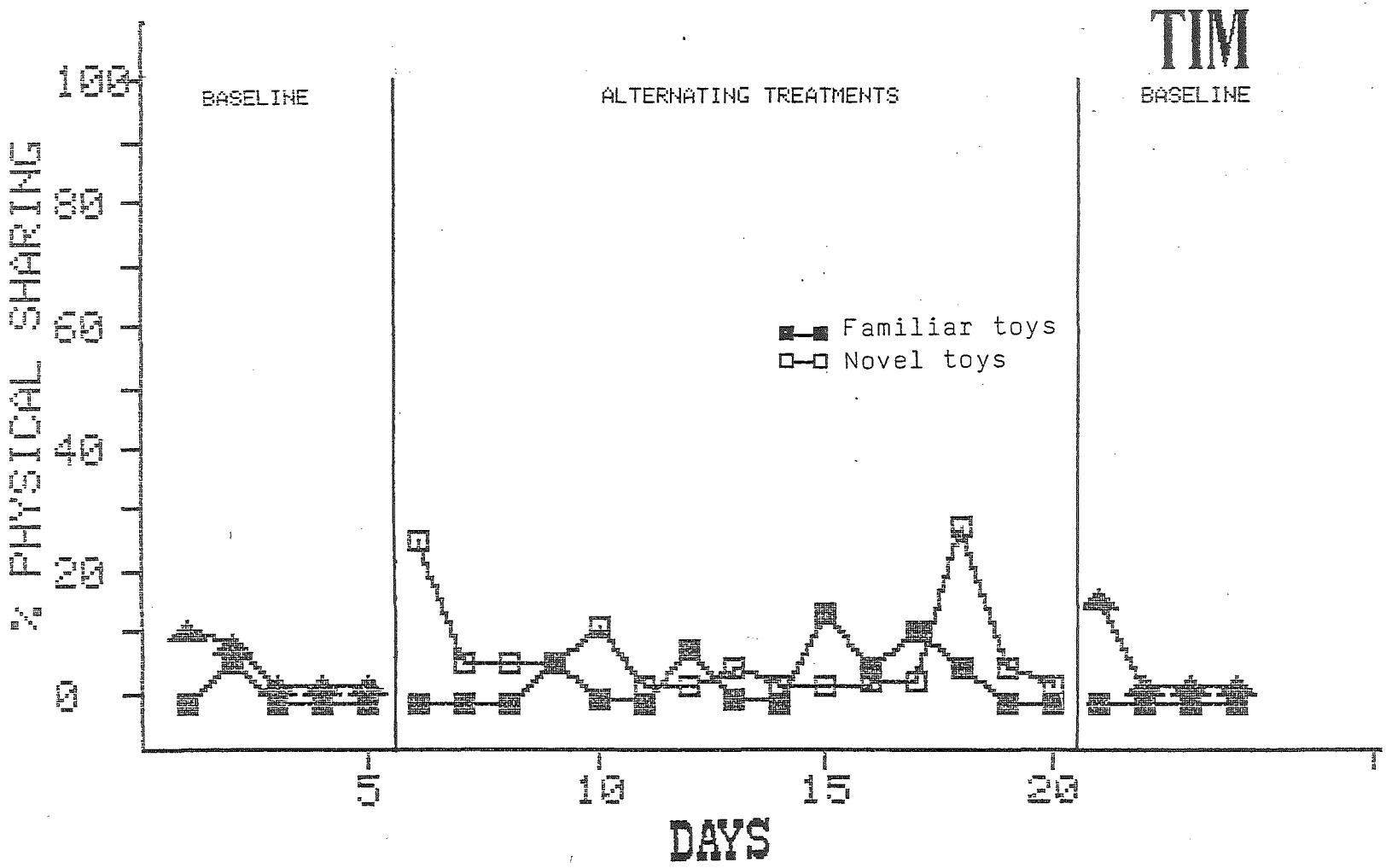
Figure Caption

Figure 2. Percent of physical sharing observed for each subject.


DEREK
BASELINE
ALTERNATING TREATMENTS
BASELINE
Familiar toys
Novel toys
% PHYSICAL SHARING
100
80
60
40
20
0
5
10
15
20
DAYS


NIGEL
BASELINE
ALTERNATING TREATMENTS
BASELINE
Familiar toys
Novel toys
% PHYSICAL SHARING
100
80
60
40
20
0
5
10
15
20
DAYS


SHANE
BASELINE
ALTERNATING TREATMENTS
BASELINE
% PHYSICAL SHARING
100
80
60
40
20
0
Familiar toys
Novel toys
5
10
15
20
DAYS


TIM
BASELINE
ALTERNATING TREATMENTS
BASELINE
Familiar toys
Novel toys
% PHYSICAL SHARING
0
20
40
60
80
100
5
10
15
20
DAYS

experiment, with the exception of one session. During the alternating treatments phase, the percent of sharing was 45 for one session involving familiar toys. For all other sessions, physical sharing occurred in 10% of sessions or less. Tim displayed low levels of physical sharing throughout the experiment, reaching a maximum of 28% during the alternating treatments phase when novel toys were being used. There were no major differences between the novel-toys and familiar-toys conditions.

Insert Table 5 about here

Verbal Sharing - initiations

Verbal initiations occurred at near-zero levels for all participants. The highest mean percent of verbal initiations for any experimental phase was 1.1.

Verbal Sharing - agreements

Across all phases of the experiment, the mean percent of verbal agreements ranged from 0.0 to 0.1 for all participants.

Share Refusal

This occurred at low levels for all participants. For Derek, the mean percent of share refusals was 0.4 maximum. Nigel showed the highest percent of share refusals during the novel toys condition, when it averaged 3.3%. Shane also displayed low levels of share refusal. The mean percent was 1.5 which occurred during the novel toys condition. For Tim, the highest mean percent of share refusals

Table 5

The Mean Rate of Play Behaviours Across Phases

	Baseline	Familiar Toys	Novel Toys	Baseline
DEREK				
Physical Sharing	1.1	0.8	3.9	8.3
Verbal Initiation	0.0	0.0	0.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	0.4	0.2	0.3	0.0
Grabbing	0.0	0.3	0.2	0.2
Positive Social	0.0	0.0	0.0	0.0
Negative Social	0.4	2.2	1.0	3.6
Inactivity	0.2	2.3	7.9	4.3
Independent Play	99.0	97.0	88.6	89.6
NIGEL				
Physical Sharing	7.0	11.0	10.9	11.1
Verbal Initiation	0.2	1.1	0.2	0.0
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	0.8	1.6	3.3	0.6
Grabbing	1.4	1.3	1.2	0.4
Positive Social	0.0	0.0	0.0	0.0
Negative Social	8.3	1.7	5.2	0.4
Inactivity	0.7	1.1	1.0	1.6
Independent Play	90.5	90.7	90.6	89.6
SHANE				
Physical Sharing	0.5	4.4	3.0	0.4
Verbal Initiation	0.0	0.1	0.7	0.0
Verbal Agreement	0.0	0.1	0.0	0.0
Share Refusal	0.7	0.6	1.5	0.0
Grabbing	0.5	0.9	2.0	1.3
Positive Social	0.0	0.0	0.0	0.0
Negative Social	3.0	4.9	6.7	6.3
Inactivity	1.0	6.0	10.7	2.1
Independent Play	97.3	90.2	83.0	96.2
TIM				
Physical Sharing	3.0	3.6	6.0	2.5
Verbal Initiation	0.0	0.0	0.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	0.7	0.1	0.3	0.0
Grabbing	0.2	0.0	0.0	0.0
Positive Social	0.0	0.0	0.0	0.0
Negative Social	6.8	3.0	2.3	1.0
Inactivity	0.0	4.7	5.0	3.3
Independent Play	90.7	90.3	88.5	93.8

was during baseline.

Grabbing

The mean percent of grabbing ranged from 0.0 to 2.0 across all phases. The data showed no apparent trends.

Positive Social

All participants displayed zero levels of positive social behaviour for the duration of the experiment.

Negative Social

This occurred at variable but low levels throughout the experiment. Derek showed the highest level during Baseline 2, when the mean percent of responses was 3.6. For Nigel, the mean percent of this behaviour ranged from 0.4 to 8.3, the highest being in during Baseline 1. Shane engaged in negative social behaviour for a minimum of 3.0% of intervals during Baseline 1, and a maximum of 6.7% of intervals during the novel toys condition. Tim's mean percent of negative social behaviour ranged from 1.0 to 6.8 across conditions, with the maximum percent of responses occurring during Baseline 1.

Inactivity

This occurred at low levels for all participants. For Derek, the lowest mean percent of inactivity was 0.2, which occurred during Baseline 1. The highest level of inactivity occurred during the novel toys condition when this behaviour occurred in 7.9 intervals, on average. Nigel's mean percent of inactivity ranged from 0.7 to 1.6,

with the highest level in Baseline 2. Shane engaged in low levels of inactivity during Baseline 1 and Baseline 2, when the mean percentages were 1.0 and 2.1 respectively. Higher levels were observed during the familiar toys and novel toys conditions, when the mean percent of intervals spent in inactivity was 6.0 and 10.7 respectively. Tim engaged in zero percent of this behaviour during Baseline 1. The highest level of inactivity occurred during the novel toys condition when the mean percent was 5.0%.

Independent Play

For the duration of the experiment, this behaviour occurred at high levels across all participants. Derek engaged in independent play for a minimum of 88.6% of sessions during the novel toys condition and a maximum of 99.0% of sessions during Baseline 1. Independent play varied little across experimental phases, the mean percent of responses ranging from 89.6 to 90.7. Shane displayed the lowest level of this behaviour during the novel toys condition (mean = 83.0%) and the highest level of responses during Baseline 1 (mean = 97.3%). For Tim, the least amount of independent play occurred during the novel toys condition when the mean percent of responses was 88.5. Independent play reached a maximum of 90.7% during Baseline 2.

Familiar versus Novel Toys

The results indicated that there was little difference in the data gained from the familiar toys and the novel toys conditions. Physical sharing occurred at low levels during all phases of the experiment. In addition, both forms of verbal sharing were exhibited at near-zero

levels. The collateral behaviours generally showed consistency throughout the experiment. There were no trends in the data which consistently indicated condition-related changes.

DISCUSSION

The results indicated that the use of novel play materials did not increase the frequency of independent play with mentally retarded children. This finding differs from the findings of previous studies which have indicated that independent play increases when novel toys are provided (Rabinowitz et al., 1975). One factor which might explain the present finding is that independent play was already occurring at high levels for all participants thus there may have been a ceiling effect.

The introduction of novel toys in Phase II did not affect sharing or collateral behaviours during play sessions. This finding is interesting given that no previous research on this topic could be located against which to compare the present results. One reason for the lack of behaviour change may be that mentally retarded children often exhibit large social skills deficits and may not develop sharing skills without specific training. Consequently, the change in the novelty/familiarity dimension of play materials may have been of little significance to the mentally retarded participants. Previous research on sharing in mentally retarded children is consistent with this explanation (also see results of Exp 2).

An alternative hypothesis is that the participants did not notice the changes in play materials and thus did not behave any differently. This would seem unlikely given that the participants were only mildly

mentally retarded. In addition, there was anecdotal evidence to suggest that the children were excited and interested in the new play materials. Of relevance to this theory is the idea that there may have been sufficient quantities of both novel and familiar toys so that the children could continue their previous behaviour patterns (i.e., playing independently).

Weiner et al. (1969) found that there were observable differences in the types of toy play behaviours exhibited by mentally retarded, autistic, and normal children. The retarded group spent significantly greater amount of time in pounding activities while normal children engaged in more pushing and pulling of toys. These results offer an explanation as to why participants in the present experiment failed to share more frequently with one group of toys. It may be that mentally retarded children are not as responsive to the novel aspect of toys, particularly if they are using these toys for the main purpose of pounding. However, one problem with this line of argument is that the children in Weiner et al.'s (1969) study had a mean age of five years while the subjects in the present study were significantly older and may not have engaged in pounding of toys to such an extent.

Verbal sharing, both initiations and agreements, occurred at near-zero levels throughout the experiment. This finding is consistent with that in Exp 2 which indicated that mentally retarded children seldom engage in verbal sharing. As suggested in Exp 2, this may be due to the limited verbal repertoires or speech impediments of some participants. A related hypothesis is that these children have not yet had the opportunity to learn verbal-social skills such as asking to share. This explanation is also consistent with the finding that

all boys had zero levels of positive social behaviour for the duration of the experiment. It appears that the social skills repertoires of these mildly mentally retarded children were extremely limited.

Inappropriate behaviours (i.e., share refusal, grabbing, and negative social) occurred at low levels throughout the experiment. This was also the case in Exp 2 in which grabbing, share refusal and negative social behaviour occurred at low percents. This indicates that these children do not interact at all even in a negative fashion. It may be that mentally retarded children learn to keep their distance since interaction intermittently produces aversive consequences, especially in residential settings.

The present experiment opens a number of avenues for future research. For example, it is important that future research is conducted to determine the effects of other physical properties of play materials on sharing and play behaviour. As suggested earlier, characteristics such as the quantity of play materials may be influential in determining the frequency of sharing. In addition, research is necessary on the effects of different play materials with moderately, severely and profoundly mentally retarded persons since few studies exist with these populations.

EXPERIMENT 4

A number of studies have shown that the physical properties of toys are influential in determining play behaviour (e.g., Rabinowitz et al., 1975; Quilitch & Risley, 1973). However, Barton (1982) has noted that many areas of research have yet to be investigated. One area which deserves further attention is the question of quantity of play materials. While it has been suggested that the provision of certain numbers of play materials may encourage or discourage sharing, there is a paucity of research on this topic. Different numbers of toys have been employed in sharing studies resulting in a lack of standardization across studies. Another problem is that researchers have often failed to specify the quantity of play materials used. This omission has limited the possibility for in-depth analyses of the empirical findings and has precluded the use of between-study comparisons. Despite the lack of empirical data from well-controlled studies, there is anecdotal evidence to suggest that more sharing will occur when toy resources are limited or when the number of children exceeds the number of play materials (see Barton, 1982).

Few studies have been conducted which evaluate the effects of different quantities of materials on independent play. Johnson and Bailey (1977) showed that the provision of recreational materials increased the amount of leisure activity among women in a half-way house. In a similar study, Reid et al. (1978) found that the provision of recreational resources resulted in increased levels of leisure activity among physically disabled, mentally retarded adults. Wehman (1978) demonstrated that toy proximity resulted in high levels

of independent play among severely and profoundly handicapped subjects. These studies suggest that the provision of recreational materials alone is sufficient to increase independent play. However, these investigations focused only on the effects of presence versus absence of materials. No attempt was made to evaluate the comparative effects of few versus many play materials.

Jones (1980 cited in Jones et al., 1984) showed that the provision of two or three toys instead of one can increase levels of independent play in profoundly retarded, multihandicapped children. In a similar study, Johnson (1935)found that preschool children engaged in more play when large quantities of play equipment were available. In addition, there were concurrent decreases in inappropriate behaviour. These studies suggest that children engage in higher rates of independent play when large numbers of play materials are available to choose from, when compared to their play if only a limited number of materials are available. One reason for this is that there is less likelihood of the children becoming bored with the materials. Collectively, these studies suggest that independent toy play can be increased by manipulating the number of toys available.

There is a paucity of research which has investigated the effects of different quantities of play materials on sharing and social behaviour. Barton (1982) cites two conference papers which have focused on this topic (Partington, 1980; Robson et al., 1980). Robson et al. (1980) found that children were more likely to share when the number of play materials was less than the number of children present. When the number of toys and children was equal there were fewer instances of sharing. Johnson (1935) reported findings consistent

with those of Robson et al. (1980). When large quantities of play equipment were provided the frequency of social play decreased. In contrast, Partington (1980) showed that the quantity of toys did not affect sharing although he did find that multiple-piece toys resulted in more sharing than single-piece toys. This may account for the results of Robson et al. (1980) who reportedly used single-item toys only. Due to the small number of studies which have investigated the effects of quantity of play materials on sharing, few conclusions can be made. Further, the lack of information concerning the numbers of toys used in the two conference papers (Partington, 1980; Robson, Lishutz, & Jason, 1980) makes interpretation difficult.

The present experiment was designed to assess the effects of few versus many play materials on sharing and collateral behaviours. One goal of this research was to improve on previous research which has failed to specify the numbers of play materials used, has involved inadequate research methodology, and has been restricted to normal children. Since mentally retarded children often have severe sharing and social skills deficits, it is important to assess the effects of antecedent variables such as the quantity of play materials.

METHOD

Participants and Setting

Four boys participated in this experiment. They attended the same junior class at a residential school for mildly mentally retarded boys. All participants had been classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983) and were aged

between 10 and 12 years (mean = 11.5). Etiology of mental retardation was unknown. The participants exhibited various behavioural excesses and/or deficits including stereotypy, withdrawal, aggression, and autistic behaviour. Table 6 presents information regarding individual participants. Motor, language, and cognitive problems were scored on a scale from none to severe, which was compiled from teacher records and test reports.

Insert Table 6 about here

Observations were taken in a 3m x 4m play area in the boys' classroom. The four participants were the only students present in the classroom during observation sessions. Three sets of play materials were used during the experiment. Set 1 involved the smallest quantity of toys. The set consisted of 15 large, fit-together blocks, 10 wooden blocks, one large truck, and six pieces of dolls house furniture. Set 2 was designed to ressemble the quantity of toys which the boys usually played with and consisted of 30 large fit-together blocks, 20 wooden blocks, two large trucks, and 12 pieces of doll house furniture. Set 3 consisted of 60 large fit-together blocks, 40 wooden blocks, six large trucks, and 30 pieces of dolls house furniture. All toys belonged to the classroom.

Response Definitions

Ten behaviours were recorded during play sessions in the classroom. One or more behaviours could be recorded per interval. Inactivity could only be scored when no other behaviour occurred

Table 6

Descriptive Information About Participants

Name	Age (yrs)	Problems			
		Behaviour	Motor	Language	Cognitive
Guy	12	Shyness, withdrawal	Severe	Mod	Mild
Mark	12	Aggressive outbursts	Mild	Severe	Mild
Nigel	10	Aggressive outbursts	None	Mod	Mod
Tim	12	Autism, stereotypy	None	Mild	Severe

during an interval.

1. Physical sharing: When a child allows another to use, take, or borrow a play material which the former was using (e.g., letting another child take a toy, handing a toy to another child and two children simultaneously using the same toy).

2. Symbolic sharing: When a child engages in pretend or imagined play with another child (e.g., acting out roles together, discussing a shared play fantasy).

3. Verbal sharing, initiation: When a child verbally expresses the wish to share with another child (e.g., asking to share another child's toy, inviting another child to join a play activity, or offering to share a play material with another child).

4. Verbal sharing, agreement: When a child verbally accepts an invitation to share another child's play materials or when a child verbally agrees to share his own play materials with another child.

5. Share refusal: When a child indicates verbally or nonverbally that s/he is unwilling to share (e.g., protesting when another child tries to help, declining invitations to play with another child's toys or pushing another child away when s/he tries to share).

6. Grabbing: When one child takes toys off another and the latter expresses his unwillingness.

7. Positive social: When a child directs positive attention towards another child (e.g., physical affection, positive verbalizations, and smiling). This category does not include eye contact per se.

8. Negative social: When a child intitiates any negative social interaction (e.g., hitting, swearing, shouting at another child).

This category does not include aggressive behavior directed at inanimate objects.

9. Independent play: When a child is involved in solitary play (i.e., the toy is not being used by another boy concurrently).

10. Inactivity: When a child is not engaged in any purposeful activity during an observational interval (e.g., staring into space, lying on the floor without moving).

Data Collection and Reliability

All data collection and reliability assessment procedures were identical to that in Exp 3 except that the subjects were observed for 15 minutes in this experiment instead of 20 minutes.

Experimental Design and Procedures

An alternating treatments design (Barlow & Hayes, 1979) was used to evaluate the effects of the three quantities of toys.

Phase I. During this phase, three 15-minute observations were taken daily in the classroom play area. The play materials from Set 2 were used throughout the baseline sessions. Phase 1 lasted nine sessions.

Phase II. Following the baseline phase, each of the three toy conditions was presented on a daily basis in a random order. The observation procedures were identical to those in Phase I. Phase II lasted 36 sessions (12 sessions for each condition).

RESULTS

Interobserver agreement ranged from 94% to 100% across all

participants and behaviours. The mean percent agreement was 96.5%.

Figure 3 shows the percent of sharing responses for the four participants. Table 7 shows the mean percent of play behaviours across phases.

Insert Figure 3 about here

Physical sharing

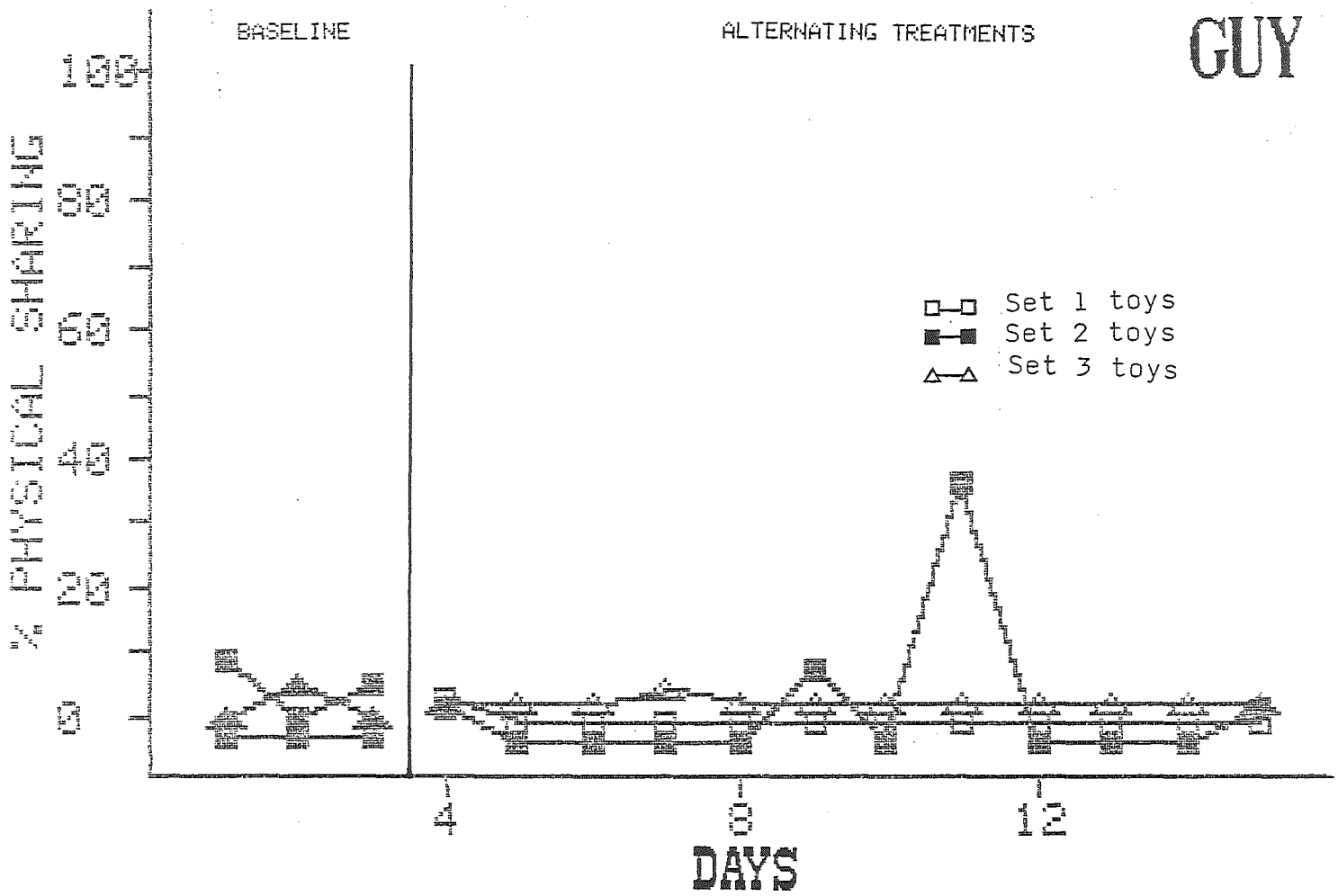
The percent occurrence of physical sharing varied throughout the experiment, with the mean percent of responses ranging from 0.4 to 23.0. For Guy, the percent of physical shares remained close to zero across all conditions. The only exception was during the alternating treatments phase when physical sharing occurred in 39% of intervals for one session with Set 2 toys. Although there were a number of exceptions, Mark showed low levels of sharing during baseline and the alternating treatments phase. For Nigel, the levels of sharing were highly variable across all experimental conditions. In Baseline 1, the percentage of shares ranged from 4% to 57%, increasing to 65% during the alternating treatments when Set 1 toys were provided. Tim displayed variable levels of physical sharing throughout the experiment. During baseline, his sharing ranged from 9% to 39%, reaching a maximum of 48% twice during the alternating treatments phase when Set 1 and Set 2 toys were used. Set 3 toys appeared to result in the lowest percent of physical sharing.

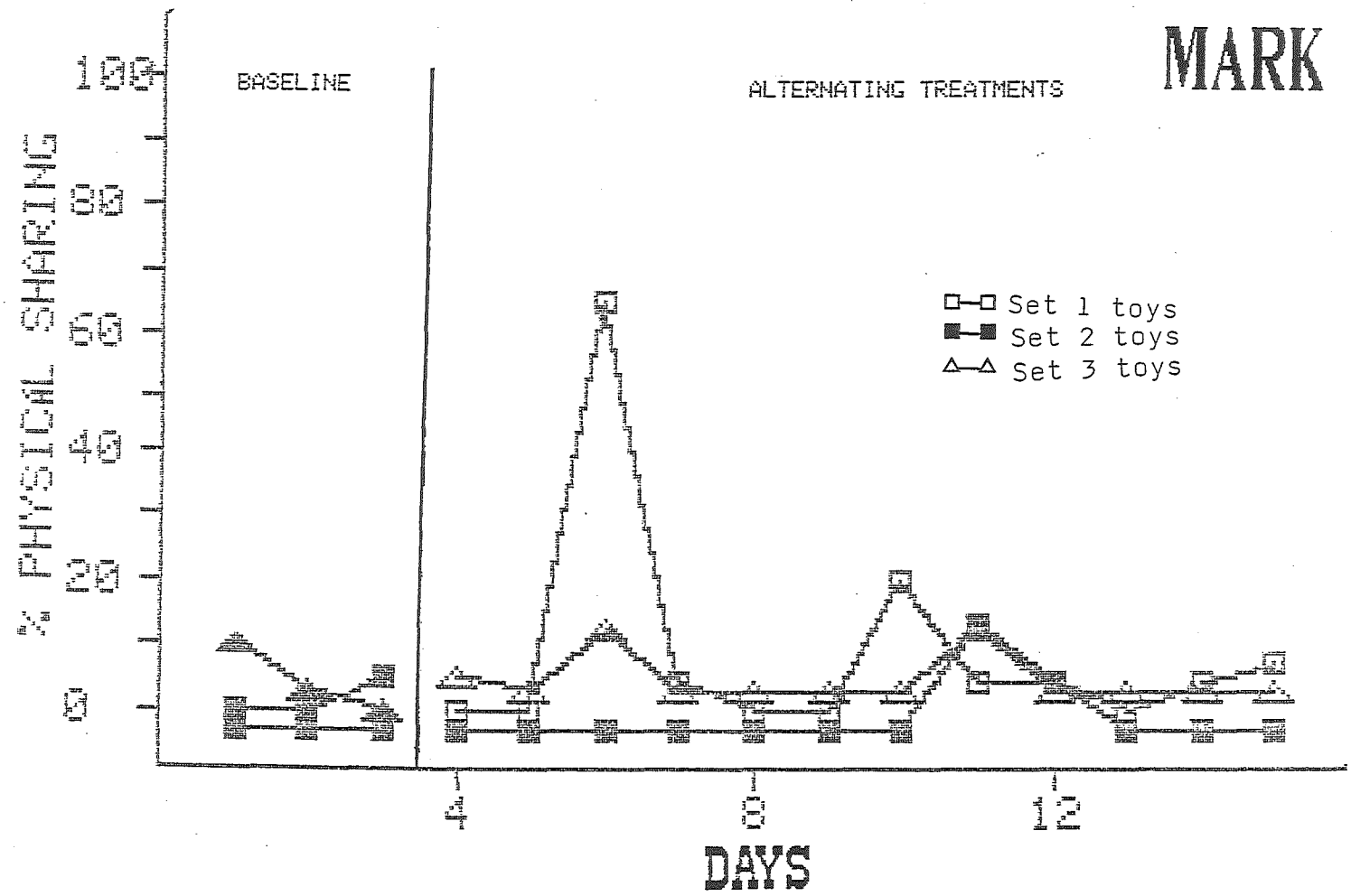
Symbolic sharing

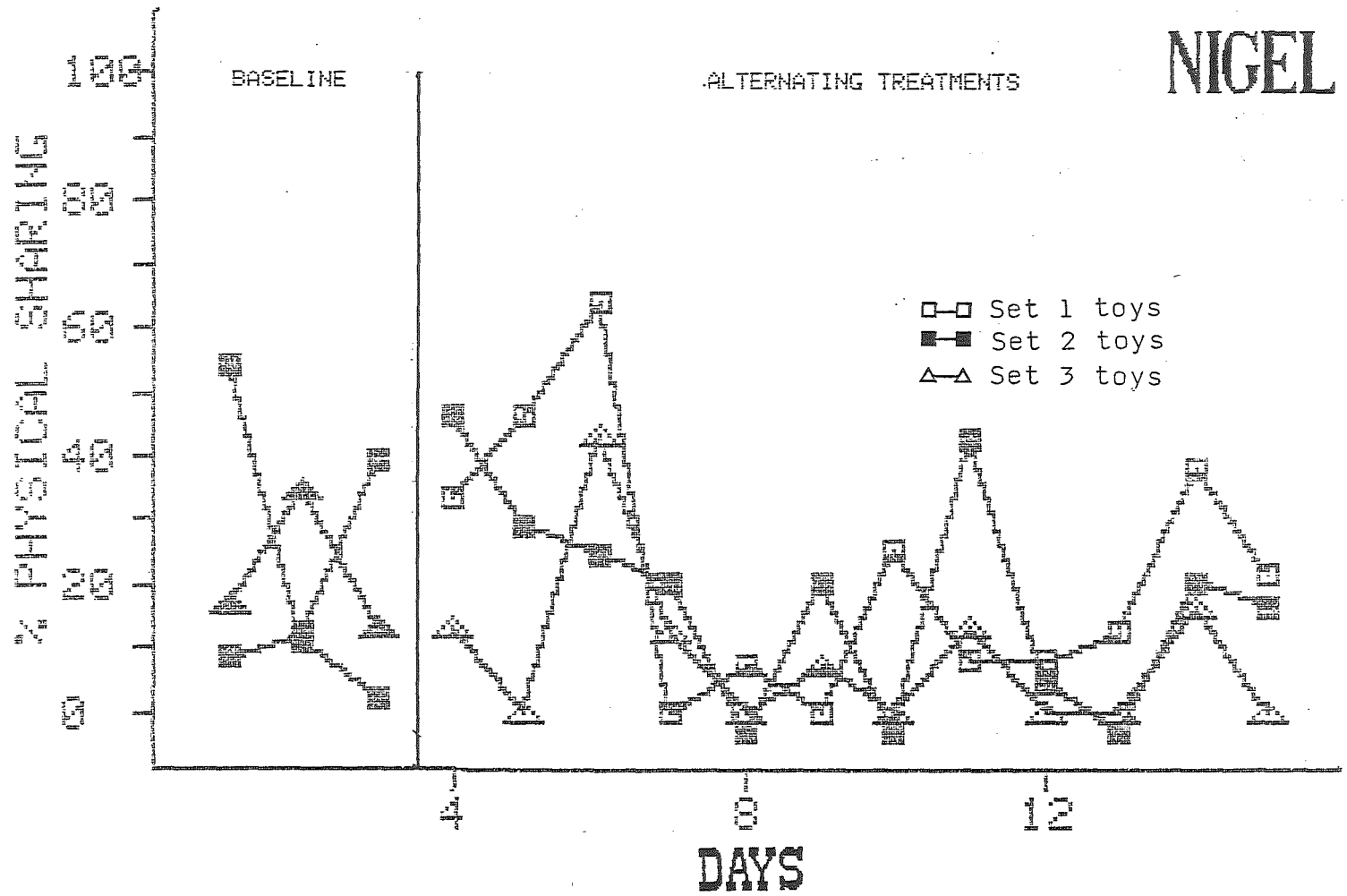
This occurred at low levels for all participants. The mean

Figure Caption

Figure 3. Percent of physical sharing observed for each subject.


BASELINE
ALTERNATING TREATMENTS
GUY
% PHYSICAL CHECKING
0
20
40
60
80
100
Set 1 toys
Set 2 toys
Set 3 toys
4
8
12
DAYS


MARK
BASELINE
ALTERNATING TREATMENTS
% PHYSICAL SHARING
0
20
40
60
80
100
Set 1 toys
Set 2 toys
Set 3 toys
4
8
12
DAYS


NIGEL
BASELINE
ALTERNATING TREATMENTS
% PHYSICAL SHARING
0
10
20
30
40
50
60
70
80
90
100
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Set 2 toys
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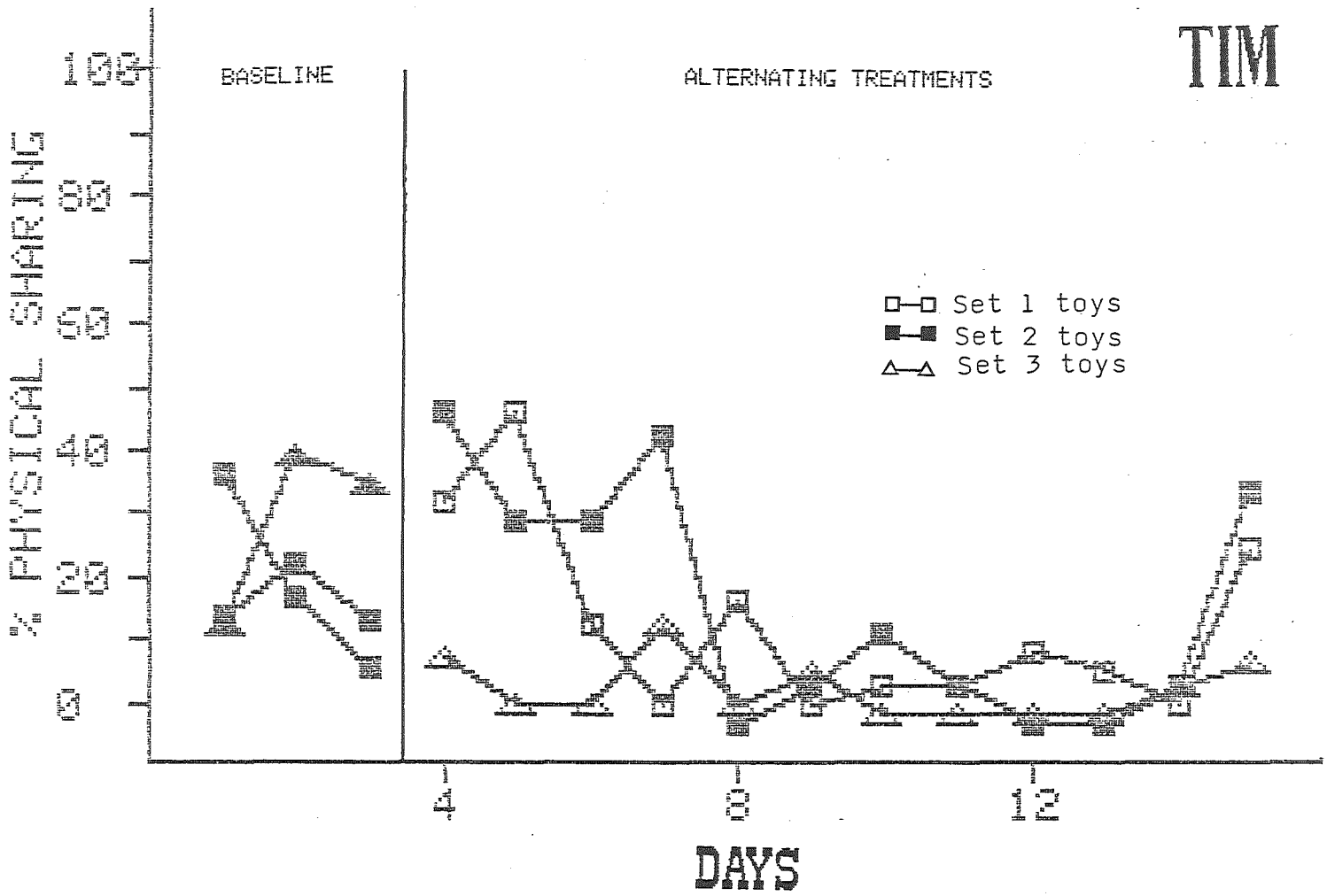
4
8
12
DAYS


TIM
BASELINE
ALTERNATING TREATMENTS
Set 1 toys
Set 2 toys
Set 3 toys
% PHYSICAL CONTACT
100
80
60
40
20
0
4
8
12
DAYS

percent of symbolic sharing for Guy ranged from 0.0 to 0.4 across experimental conditions. Mark exhibited low levels of this behaviour. For Nigel, symbolic sharing ranged 0.4 to 5.0, with the highest occurrence with Set 2 toys in phase II. Tim also had the highest percent of symbolic sharing during the Set 2 toys condition. The maximum rate was 7.6%.

Verbal Sharing - initiations

Verbal initiations occurred at near-zero levels for all participants. The highest mean percent of verbal initiations for any experimental phase was 0.9 (see Table 7).

Insert Table 7 about here

Verbal Sharing - agreements

Across all phases of the experiment, the mean percent of verbal agreements ranged from 0 to 0.7.

Share Refusal

This occurred at low levels for all participants. For Guy and Mark, the mean percent of share refusals was 0.4. Nigel showed the highest percentage of share refusals during the Set 1 toys condition when it averaged 2.9%. For Tim, the highest mean rate of share refusals was 1.1, occurring during the alternating treatments phase when Set 1 toys were provided.

Table 7

The Mean Percentage of Play Behaviours Across Phases

	Baseline	Set 1 Toys	Set 2 Toys	Set 3 Toys
GUY				
Physical Sharing	2.2	0.4	4.7	0.4
Symbolic Sharing	0.0	0.4	0.4	0.0
Verbal Initiation	0.0	0.0	0.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	0.0	0.4	0.4	0.0
Grabbing	0.0	0.0	0.4	0.4
Positive Social	0.0	0.0	0.0	0.0
Negative Social	0.0	0.4	1.1	0.4
Inactivity	4.8	25.0	4.3	1.5
Independent Play	93.1	73.6	90.6	97.8
MARK				
Physical Sharing	1.3	9.4	1.5	1.1
Symbolic Sharing	0.4	1.5	1.1	0.0
Verbal Initiation	0.0	0.0	0.0	0.7
Verbal Agreement	0.0	0.7	0.0	0.0
Share Refusal	0.0	0.4	0.0	0.0
Grabbing	1.3	5.8	1.5	1.5
Positive Social	0.0	0.0	0.0	0.0
Negative Social	1.3	2.2	2.5	0.7
Inactivity	4.8	5.1	3.6	0.7
Independent Play	92.2	83.0	94.2	96.4
NIGEL				
Physical Sharing	20.9	22.8	19.6	9.1
Symbolic Sharing	3.1	4.7	5.0	0.4
Verbal Initiation	0.9	0.0	0.7	0.7
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	1.3	2.9	0.7	1.5
Grabbing	1.8	4.0	2.2	0.4
Positive Social	0.0	0.0	0.0	0.0
Negative Social	0.0	0.7	0.4	0.4
Inactivity	0.4	6.9	0.4	0.4
Independent Play	74.4	65.2	77.2	90.6
TIM				
Physical Sharing	23.0	12.7	17.8	2.9
Symbolic Sharing	3.9	3.3	7.6	0.4
Verbal Initiation	0.0	0.4	0.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0
Share Refusal	0.0	1.1	0.0	0.0
Grabbing	0.4	0.4	0.0	0.4
Positive Social	0.0	0.0	0.0	0.0
Negative Social	0.0	1.5	0.4	0.0
Inactivity	2.2	23.5	6.2	2.2
Independent Play	73.9	64.1	73.2	94.2

Grabbing

This occurred at low levels throughout the experiment. For Guy, the mean percent of grabbing ranged from 0.0 to 0.4 across all conditions. Mark grabbed the most (5.8%) when Set 1 toys were provided during the alternating treatments phase. Nigel also showed the highest level of grabbing during the Set 1 toys condition. His mean percent of responses ranged from 0.4 to 4.0 across all conditions. Tim engaged in grabbing at near-zero levels, reaching a maximum of 0.4%.

Positive Social

No subject displayed any positive social behaviour for the duration of the experiment.

Negative Social

This occurred at low levels throughout the experiment. For Guy, the mean percent of responses ranged from 0.0 to 1.1, with the highest rate occurring during the Set 2 toys condition of the alternating treatments phase. Mark's mean percent of negative social responses ranged from 0.7 to 2.5, with the largest score occurring during the Set 2 toys condition of phase II. For Nigel, this behaviour occurred at near-zero levels with a maximum of 0.7% responses. Negative social behaviour by Tim ranged from 0.0% to 1.5% across all conditions, with the maximum percentage of responses occurring during the condition in which Set 1 toys were presented.

Inactivity

This occurred at low levels for two participants and at higher levels for the other two. Guy was inactive for a mean of 4.8% of intervals during baseline. He showed similar levels of inactivity when Set 2 and Set 3 toys were available. However, when the toys from Set 1 were available Guy was inactive for 25% of intervals. Mark's level of inactivity remained low across all experimental conditions, with the maximum being 5.1% during Set 1 toys. Nigel's inactivity ranged from 0.4% to 6.9%, with the maximum occurring during the Set 1 toys condition. Tim showed low levels of inactivity during all conditions except when Set 1 toys were available (23.5%).

Independent Play

For the duration of the experiment, this independent play occurred at high levels across all participants. Guy engaged in independent play for a minimum of 73.6% of sessions during the Set 1 toys condition and a maximum of 97.8% of sessions during the Set 3 toys condition. Mark showed the lowest level of independent play during the Set 1 toys condition (mean = 83.0%) and the highest level of responses during the Set 3 toys condition (mean = 96.4%). For Nigel, the mean percent of independent play ranged from 65.2 to 90.6, with the minimum occurring during the Set 1 toys condition. Tim had 64.1% independent play responses during the Set 1 toys condition, reaching a maximum of 94.2% during the Set 3 toys condition.

Few versus Many Toys

The results indicated that for some participants, there were

significant changes in sharing and collateral behaviours as a result of the different conditions. Two (Guy, Tim) shared at higher levels during the Set 2 toys conditions. Mark shared at the highest rate during the Set 1 toys condition. Nigel showed little difference in the rate of sharing for Set 1 and Set 2 toys, but engaged in lower levels of this behaviour during the Set 3 toys condition. All participants engaged in the lowest levels of physical sharing when the Set 3 toys were provided. The rate of symbolic sharing was variable with no obvious trends apparent. Positive social behaviour and both forms of verbal sharing were exhibited at near-zero levels across all conditions. Inappropriate behaviours including, share refusal, grabbing and negative social behaviour occurred at low levels across all experimental conditions. One exception was inactive behaviour which occurred at the lowest level during the Set 1 toys condition.

DISCUSSION

The results showed that the rate of independent play increased when large numbers of toys were used. This finding is consistent with previous research which has indicated that independent play increases as a function of toy availability (Johnson, 1935; Johnson & Bailey, 1977; Reid et al., 1978; Wehman, 1978). The results of the present experiment also lend support to the investigation by Jones (1980) which indicated that two or three toys produce more independent play than one toy. One reason for this might be that children become bored with a limited number of toys. In the present experiment, the number of toys was manipulated without introducing novel types of play materials into the larger sets of toys. For this reason, it appears

that it was not the novelty component per se which enhanced independent play. Rather, the fact that there were simply more toys available for a number of uses may have been the cause of increases in play. There was anecdotal evidence to suggest that the participants became bored with Set 1 toys. They often asked why they couldn't have a larger range of toys and complained that there was "nothing to do" with these toys. In support of this hypothesis the data show that for all participants inactivity occurred at maximum levels when Set 1 toys were used.

The introduction of different quantities of toys in Phase II did not affect sharing or collateral behaviours during play sessions. This finding is interesting in the light of previous research which has provided contradictory evidence. Robson et al. (1980) reported that sharing increased when limited numbers of toys were used although these results may have been influenced by the experimenter's inclusion of single-item toys only. Johnson (1935) found that large quantities of play equipment resulted in less social play. In this study, the independent variable was the quantity of playground equipment as opposed to toys. Consistent with the present experiment, Partington (1980) provided both single-item and multiple-item toys. His results showed that the quantity of play materials did not affect sharing. The findings from the present experiment are in partial agreement with Partington (1980) in that there were no marked changes in sharing as a result of the limited numbers of toys. For three participants, more sharing occurred in the Set 1 toys condition when compared with the Set 3 toys condition. However, the difference between conditions was always small.

One reason for the lack of dramatic behaviour change may be that mentally retarded children generally share at low levels and may not possess sufficient skills to share more. In addition, it may be that there is no pay-off for sharing with other mentally retarded children when they are likely to deliver aversive consequences as a result. This suggestion is supported by the data which showed that the subjects did not engage in positive social behaviour at all, probably because mentally retarded children may find sharing to be a very nonreinforcing pastime. The fact that inappropriate behaviours such as grabbing sometimes occurred at higher levels during Set 1 toys condition suggests that participants might be discouraged from sharing under these conditions.

Symbolic sharing occurred at low levels throughout the experiment. This response class was originally included because it was thought that the participants might develop imaginative games to compensate for the lack of play materials. However, this did not happen. It may be that mentally retarded children are less adept at imaginative play and for this reason did not adopt this behaviour readily. Existing literature indicates that normal children engage in a high frequency of imaginative or symbolic sharing while mentally retarded children take longer to exhibit this form of play.

Verbal sharing, both initiations and agreements, occurred at near-zero levels throughout the experiment, replicating the findings of Exps 2 and 3. As suggested in previous experiments, this may be due to the limited verbal repertoires or speech impediments of some participants. A related hypothesis is that these children have not yet had the opportunity to learn verbal-social skills such as asking

to share.

Inappropriate behaviours (i.e., share refusal, grabbing, and negative social) occurred at low levels throughout the experiment. This finding is consistent with the results of earlier experiments.

In sum, the results of Exp 3 and 4 showed that the manipulation of antecedent variables, novelty/familiarity and quantity of play materials, failed to produce consistent or marked effects on sharing behaviour.

EXPERIMENT 5

Traditionally operant conditioning techniques have been used in applied settings to control the behaviour of individuals. However, with the introduction of token systems which enabled the control of groups of individuals, other group reward systems were developed. In the earliest investigations, laboratory analogues of group contingencies were evaluated (Azrin & Lindsley, 1956; Glaser & Klaus, 1966). These studies showed that group contingencies were an effective and practical method of modifying behaviour.

In the last few decades, there has been a considerable number of studies which have evaluated the effects of group contingencies in applied settings. Group contingencies have proved popular for a number of reasons. First, researchers have noted that the use of group contingencies allows children to be managed by fewer caregivers and teaching personnel (Quay, Werry, McQueen, & Sprague, 1966; Hall, Lund, & Jackson, 1968). As Herman and Tramontana (1971) have pointed out, a group contingency procedure is advantageous because "it is much easier to dispense one reinforcement to the class than it is to dispense one to each class member" (p. 118). A second advantage of group contingencies relates to the potential for peer-delivered consequences. Sulzbacher and Houser (1968) noted that the application of contingencies to an entire group of children for the deviant behaviour of an individual may result in the withdrawal of peer social reinforcement which previously served to maintain the deviant behaviour. Another positive effect of group contingencies was reported by Hamblin, Hathaway, and Wodarski (1971) who showed that

such contingencies accelerate learning more than individual reinforcement. This is due in part to the fact that spontaneous peer tutoring may occur. Hamblin et al. (1971) subsequently suggested that this teaching procedure be utilised to accelerate learning in other classroom situations.

Several types of group contingency have been identified. Litow and Pumroy (1975) divided group contingencies into two basic categories: dependent and interdependent. Dependent group contingencies operate when a small number of preselected group members determine the consequence for all members of the group. Dependent group contingencies have been used to modify a wide range of behaviours including hyperactivity, peer popularity, off-task behaviour, academic performance, and appropriate social behaviour. An interdependent contingency requires that all group members contribute to satisfy a collective response requirement before reinforcement occurs. Interdependent group contingencies have been used most frequently in the classroom setting.

Group contingencies have proven effective in the modification of behaviours such as academic performance, social interaction, stealing, and energy consumption (see Speltz, Shimamura, & McReynolds, 1982). One specific area of research has focused on the effects of group contingencies with children. For example, Barrish, Saunders, and Wolf (1969) employed the "good behavior game" to control inappropriate classroom behaviour among students. With this procedure, the class is divided into teams which compete for the lowest levels of inappropriate behaviour. The "good behavior game" has been found to be effective in reducing disruptive behaviour in school children

(Barrish et al., 1969; Grandy, Madsen, & De Mersseman, 1973; Harris & Sherman, 1973; Medland & Stachnik, 1972). Kubany, Weiss, & Sloggett (1971) made class reinforcement contingent upon the appropriate classroom behaviour of one severely disruptive, nonretarded boy. A reversal design showed that the group contingency procedure was effective in reducing inappropriate responses. Wilson and Williams (1973) applied a group contingency procedure to first-grade children for a combination of social and academic behaviour. All members of a group had to perform academic behaviours with a minimum criterion number of mistakes before all children could receive free time. The children could earn additional free time by engaging in appropriate social behaviour during the same time period. The results showed that group-contingent reinforcement was highly effective in the facilitation of appropriate classroom behaviours.

A number of studies have been conducted in which the effects of individual and group contingencies have been compared. Greenwood, Hops, Delquadri, and Guild (1974) compared the effects of rules, rules plus feedback, and rules plus feedback plus group and individual consequences on the appropriate study behaviour of elementary school children. The results indicated that the complete package was most effective but the effects of the individual and group contingencies could not be separated in this study. Walker and Hops (1975) evaluated the effects of individual, group, and individual plus group reinforcement contingencies with a symbolic modeling training procedure on social withdrawal in normal school children. The results indicated that while all three interventions effectively enhanced social interaction, the individual plus group reinforcement

contingency was most effective.

Numerous studies have indicated the superiority of group contingencies when compared with individual contingencies. Speltz et al. (1982) compared the effects of an individualized contingency and three group contingencies on children's academic and social behaviours. The results showed that for two of the four low-achieving subjects, academic behavour was of the highest standard when a group contingency was employed. Three out of four subject groups also engaged in high rates of positive social interaction during this contingency. Alexander, Corbett, and Smigel (1976) evaluated the use of group and individual contingencies on school attendance of behaviourally disordered adolescents. Group-contingent reinforcement was found to be more effective than individually-contingent reinforcement. A second experiment assessed the use of individual and group contingencies in reducing curfew violations by adolescent females at a residential facility. The results showed that the group contingency was highly effective whereas the individual contingency resulted in high rates of curfew violation.

Kazdin and Geesey (1977) provided tokens to mentally retarded children contingent upon attentive behaviour. An alternating treatments design was used to compare the effects of earning tokens for the entire class versus earning tokens for oneself. The group contingency was more effective in modifying the target subjects' behaviour. Long and Williams (1973) assessed the effects of group versus individual contingent free time in modifying disruptive classroom behaviour. The group contingency was found to maintain slightly higher levels of appropriate behaviour and greater day-to-day

stability within and between subjects. Also, the group procedure made fewer demands on the teacher's time and seemed to be a simpler procedure to implement.

Some researchers have reported little or no difference between group and individual contingencies. Frankosky and Sulzer-Azaroff (1978) demonstrated that group and individual contingencies were equally effective in the performance of a sorting task by mentally retarded men. The task was performed with almost 100% efficiency under both conditions. Herman and Tramontana (1971) showed that group and individual contingencies were equally effective in reducing the inappropriate behaviour of headstart children. Grandy et al. (1973) found no difference between group and individual contingencies in controlling disruptive classroom behaviour. Both procedures led to marked reductions in talking-out and out-of-seat behaviours of school children. Finally, a study by Axelrod (1973) showed individual and group contingencies to be equally effective.

Overall, studies have indicated that group contingencies are more effective than individual contingencies. However, it should be noted that different contingencies may be ideally suited to different applied conditions and that research to date has been plagued by a number of methodological problems. The differences in findings between group and individual contingencies may be due, in part, to variation in procedures. In some studies, the amount of reinforcement which the subject earned was not consistent across conditions (e.g., Long & Williams, 1973). Another problem has involved the use of designs which are methodologically weak. The majority of researchers have employed ABAC designs or a close equivalent, rendering all

interpretations regarding the cause of behavioural change, doubtful. Although Kazdin and Geesey (1977) have demonstrated the utility of simultaneous-treatment designs (or, alternating treatment designs) in the comparison of individual and group contingencies, few studies have utilized this procedure. The disparity in findings may be a result of variation in the magnitude of the reward available for the target subject (Wolf, Hanley, King, Lachowicz, & Giles, 1970) and the differences in instructions provided to peers regarding their behaviour towards the target subject (Rosenbaum, O'Leary, & Jacob, 1975).

Research has shown that group contingencies may enhance cooperation and social interaction among children, regardless of the target behaviour selected. These findings suggest that group contingencies may be useful in the facilitation of sharing skills among children. No studies were found which investigated the effects of group contingencies on the sharing behaviour of children. The central aim of this experiment was to investigate the effects of individual versus group contingencies on sharing and a wide range of collateral behaviours.

METHOD

Participants and Setting

Four boys participated in this experiment. All attended the same junior class at a residential school for mildly mentally retarded boys. The participants had been classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983). The mean age was 11.5 years (range: 10-12 years). Etiology of mental retardation

was unknown. The boys exhibited a variety of inappropriate behaviours (e.g., aggression, withdrawal, and stereotypy). Table 8 presents information about the individual participants. Motor, language, and cognitive problems were scored on a scale from none to severe, which was compiled from teacher records and test reports. None of the boys received medication during the course of the experiment.

Insert Table 8 about here

Play sessions were conducted in a vacant classroom (5m x 6m) which was situated in the junior school. A variety of play materials were available during the play sessions. These consisted of a bus, a crane, blocks, trucks, cars, a model house, and four toy people. Multiple-item and single-item play materials were included since there is evidence to suggest that multiple-item toys may promote sharing.

Response Definitions

Ten behaviours were recorded during play sessions in the classroom. One or more behaviours could be recorded per interval. Inactivity could only be scored when no other behaviour occurred during an interval.

1. Physical sharing: When a child allows another to use, take, or borrow a play material which the former was using (e.g., letting another child take a toy, handing a toy to another child and two children simultaneously using the same toy).

2. Verbal Sharing - initiation: When a child verbally expresses the wish to share with another child (e.g., asking to share another

Table 8
Descriptive Information About Participants

Name	Age (yrs)	Problems			
		Behaviour	Motor	Language	Cognitive
Guy	12	Shyness, withdrawal	Severe	Mod	Mild
Mark	12	Aggressive outbursts	Mild	Severe	Mild
Nigel	10	Aggressive outbursts	None	Mod	Mod
Tim	12	Autism, stereotypy	None	Mild	Severe

child's toy, inviting another child to join a play activity or offering to share a play material with another child).

3. Verbal Sharing - agreement: When a child verbally accepts an invitation to share another child's play materials or when a child verbally agrees to share his own play materials with another child.

4. Share Refusal: When a child indicates verbally or nonverbally that s/he is unwilling to share (e.g., protesting when another child tries to help, declining invitations to play with another child's toys or pushing another child away when s/he tries to share).

5. Grabbing: When one child takes toys off another and the latter expresses his unwillingness.

6. Positive Social: When a child directs positive attention towards another child (e.g., physical affection, positive verbalizations, and smiling). This category does not include eye contact per se.

7. Inappropriate: When a child intitiates any negative social interaction (e.g., hitting, swearing, shouting at another child) or any destructive behaviour towards objects (e.g., throwing toys, breaking objects).

8. Appropriate Verbalization: When a child utters any meaningful word or words in an attempt to communicate with another child present (e.g., "Pass that to me", Leave it", "fast", "yes"). This category also includes counting aloud and saying a person's name.

9. Inactivity: When a child is not engaged in any purposeful activity during an observation interval (e.g., staring into space, lying on the floor without moving).

10. Independent Play: When a child is involved in solitary play

(i.e., the toy is not being used by another boy concurrently).

Data Collection and Reliability

Data collection and reliability procedures were the same as in Exp 4 except that each observation session lasted 10 minutes.

Experimental Design and Procedures

An alternating treatments design (Barlow & Hayes, 1979) was used to assess the effects of individual and group contingencies on sharing.

Phase I. This phase constituted Baseline 1. Three 10-minute observations were taken daily in the vacant classroom. No intervention was introduced and the boys were instructed to play with the materials provided.

Phase II. This phase consituted Baseline 2 and baseline observations were taken as in the previous phase. Prior to each session, the experimenter informed the participants of the nature of physical sharing by saying: "O.K., boys, you can share by helping each other build something or by playing together with the toys". The experimenter also informed the boys that the timer would occasionally sound during the session and at that point she would look around to see if anyone was sharing. She also told them that she would put a sticker next to the name of any boy who was sharing when the timer sounded. The timer sounded four times per session, at randomly determined intervals. At this point, the experimenter interrupted the observation to announce the names of the boys who were sharing. For example, she would say "I see that Tim and Mark are sharing this

time". A large chart with the boys' names on was placed on the wall beside the experimenter. Whenever a boy was sharing when the timer sounded the experimenter placed a red sticker on the chart next to his name and observations recommenced. When the observation session was over, the experimenter made a neutral comment regarding the number of stickers which each boy had on his chart.

Phase III. During this phase the individual contingency, group contingency, and baseline II conditions were presented in random order on a daily basis. Prior to each session, the experimenter informed the boys as to the nature of the contingency. When the baseline condition was in effect, she would say "When the timer rings any boy who is sharing will get a sticker on the chart. No sweets will be given for sharing though." When the group contingency was in effect the experimenter would say "When the timer rings, everyone must be sharing then everyone will get a sticker next to their name, and everyone will get a sweet". For sessions in which the individual contingency was in effect, the experimenter said "When the timer rings, any boy who is sharing will get a sticker on the chart and a sweet for himself".

RESULTS

Interobserver agreement ranged from 93 to 100% across all participants and behaviours. The mean percentage agreement was 98.3.

Figure 4 displays the percentage of physical sharing responses per session. Table 9 shows the mean percentage of play behaviours across phases.

Insert Figure 4 about here

Physical Sharing

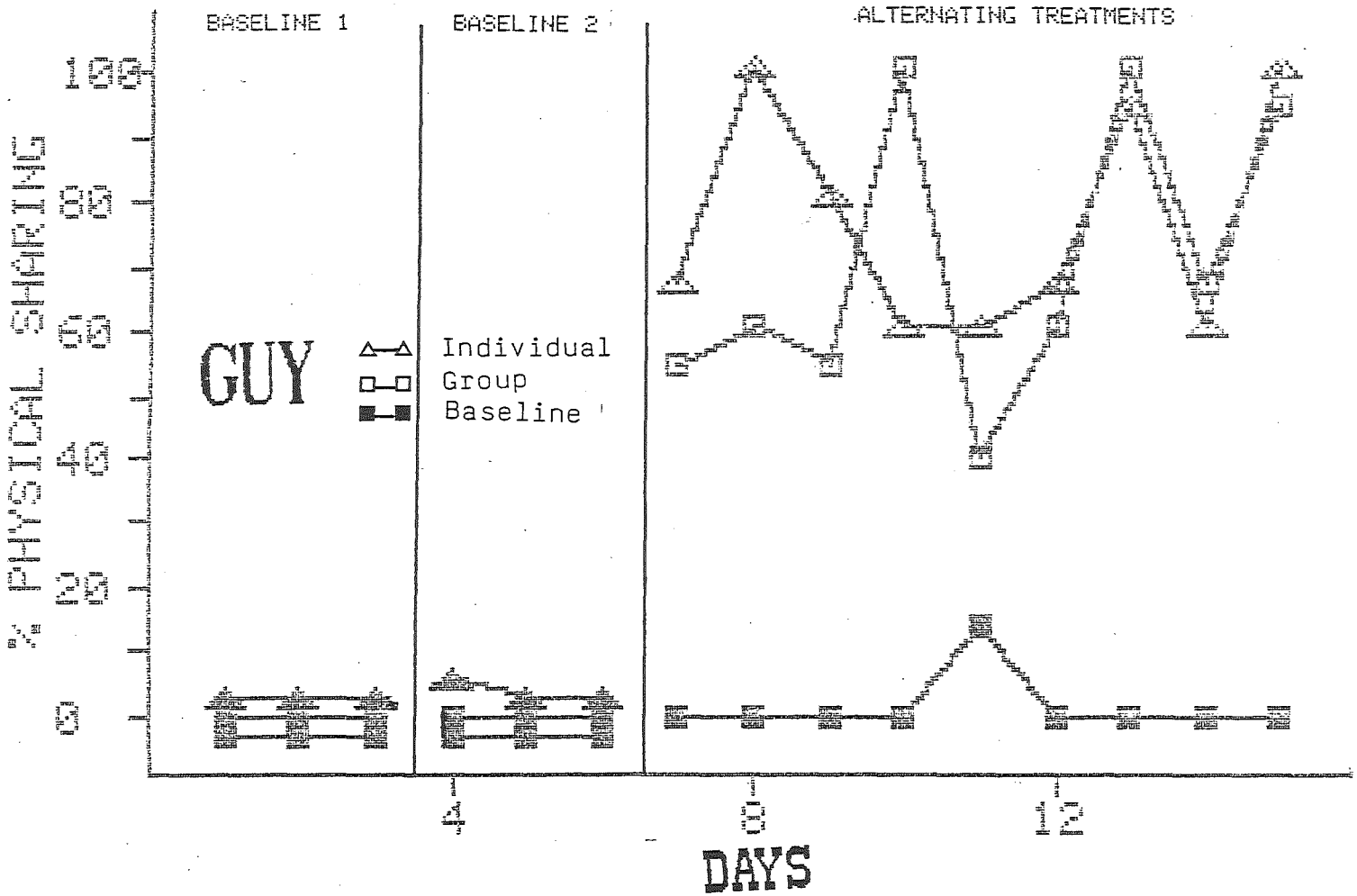
This occurred at low levels for all participants during Baseline 1 and Baseline 2, with the mean percentage of responses ranging from 0.0 to 14.1. Guy exhibited near-zero rates of physical sharing during Baseline 1 and Baseline 2. In the alternating treatments phase, it remained at low levels under the Baseline 3 condition and increased to high levels for the individual and group contingency conditions (see Figure 4). For Mark, sharing occurred at low levels during all three baseline conditions, with a mean percent of 3.7 maximum. With the implementation of individual and group contingencies, the mean rate increased to 80.0% and 73.3%, respectively. Nigel's baseline rates of sharing varied between 4.5% and 13.3%. The introduction of individual and group contingencies resulted in mean rates of 65.2% and 46.7%, respectively. Tim also shared at low levels during the three baseline conditions. The mean percent of sharing ranged from 5.2 to 14.1 during these conditions. With the implementation of the individual and group contingencies the mean percent increased to 35.5 and 25.9, respectively.

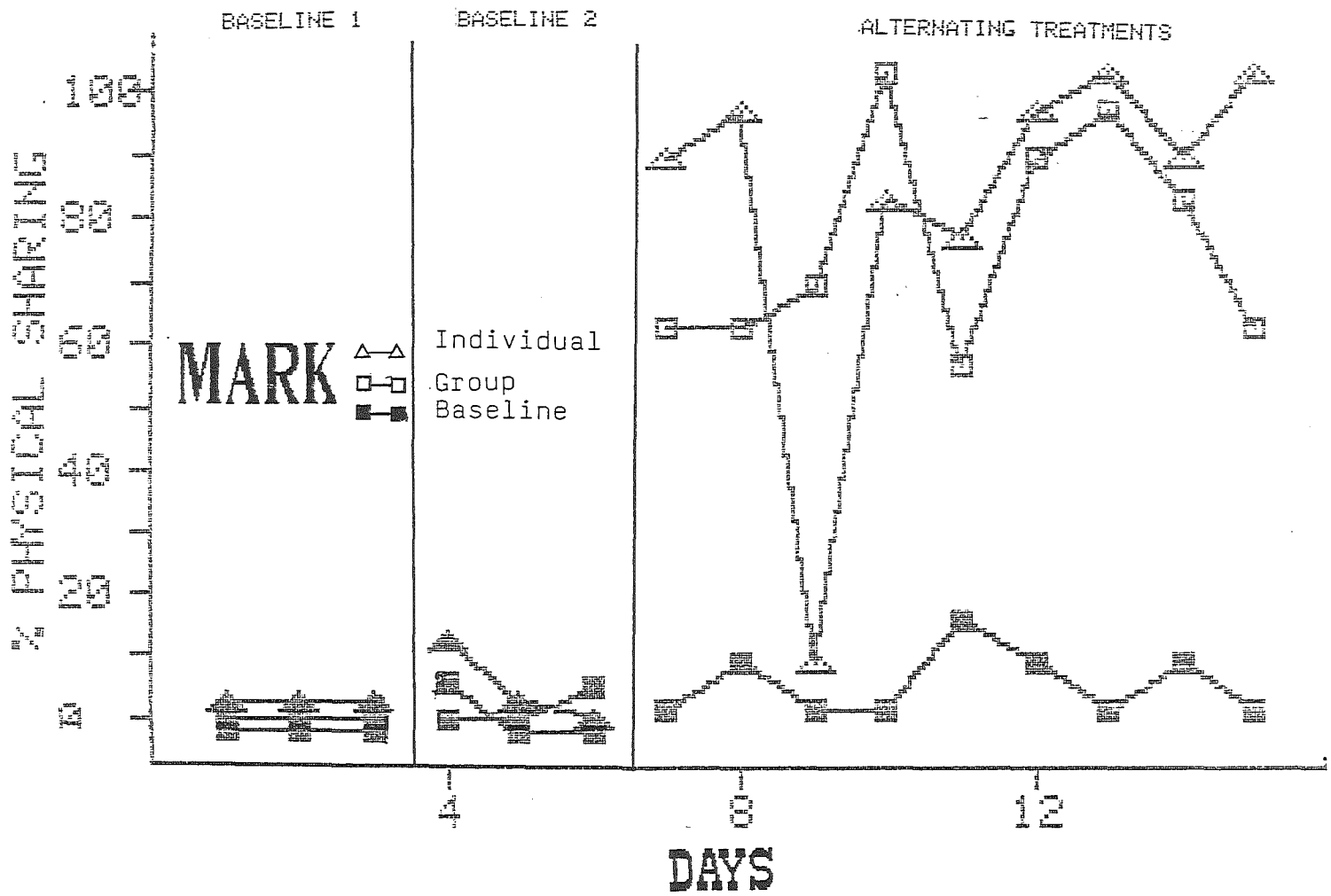
Verbal Sharing - Initiations

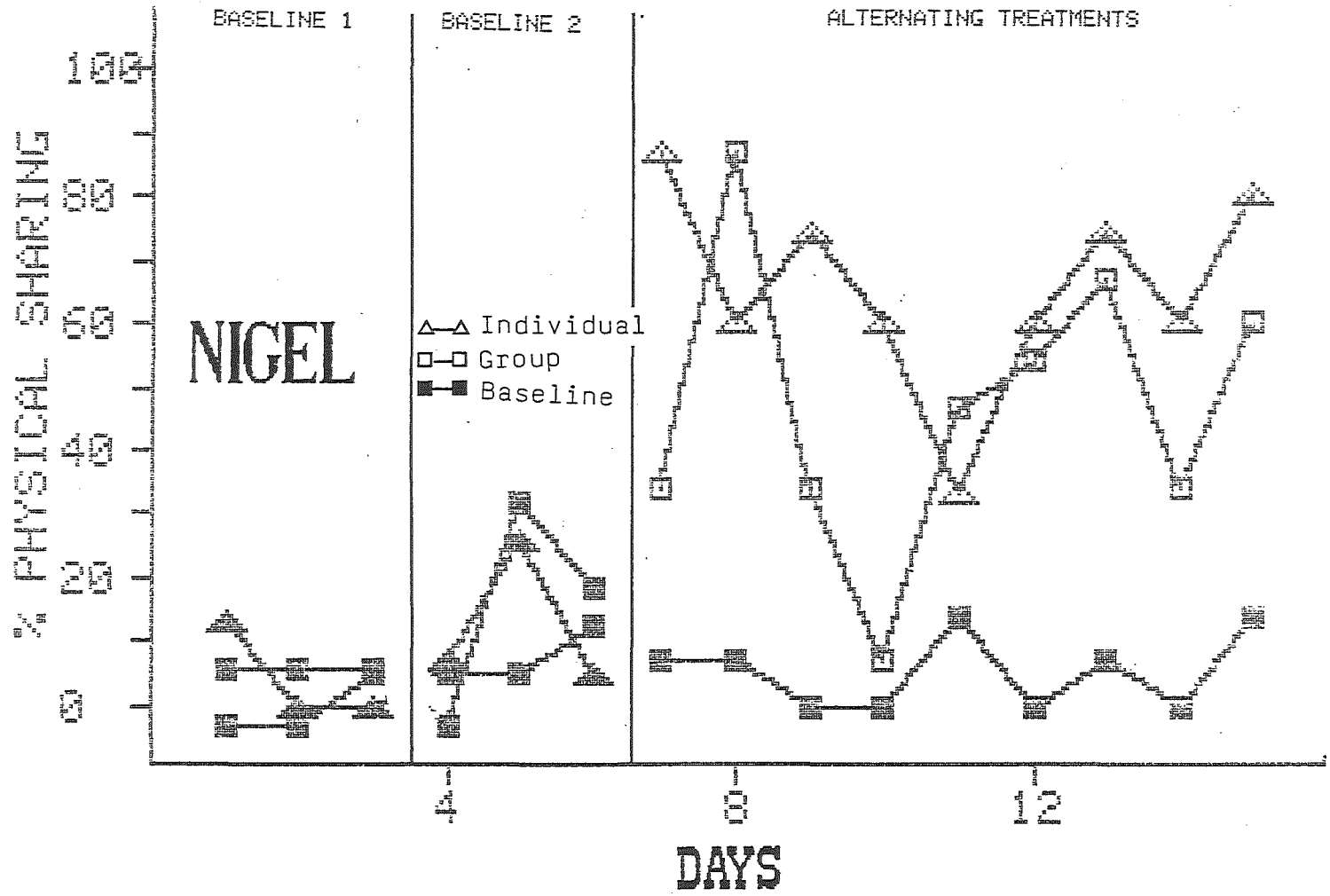
Verbal initiations occurred at low levels throughout the experiment. Guy exhibited near-zero levels of this behaviour for all conditions except the group contingency. Mark also engaged in low rates of verbal initiation during the baseline conditions and with the

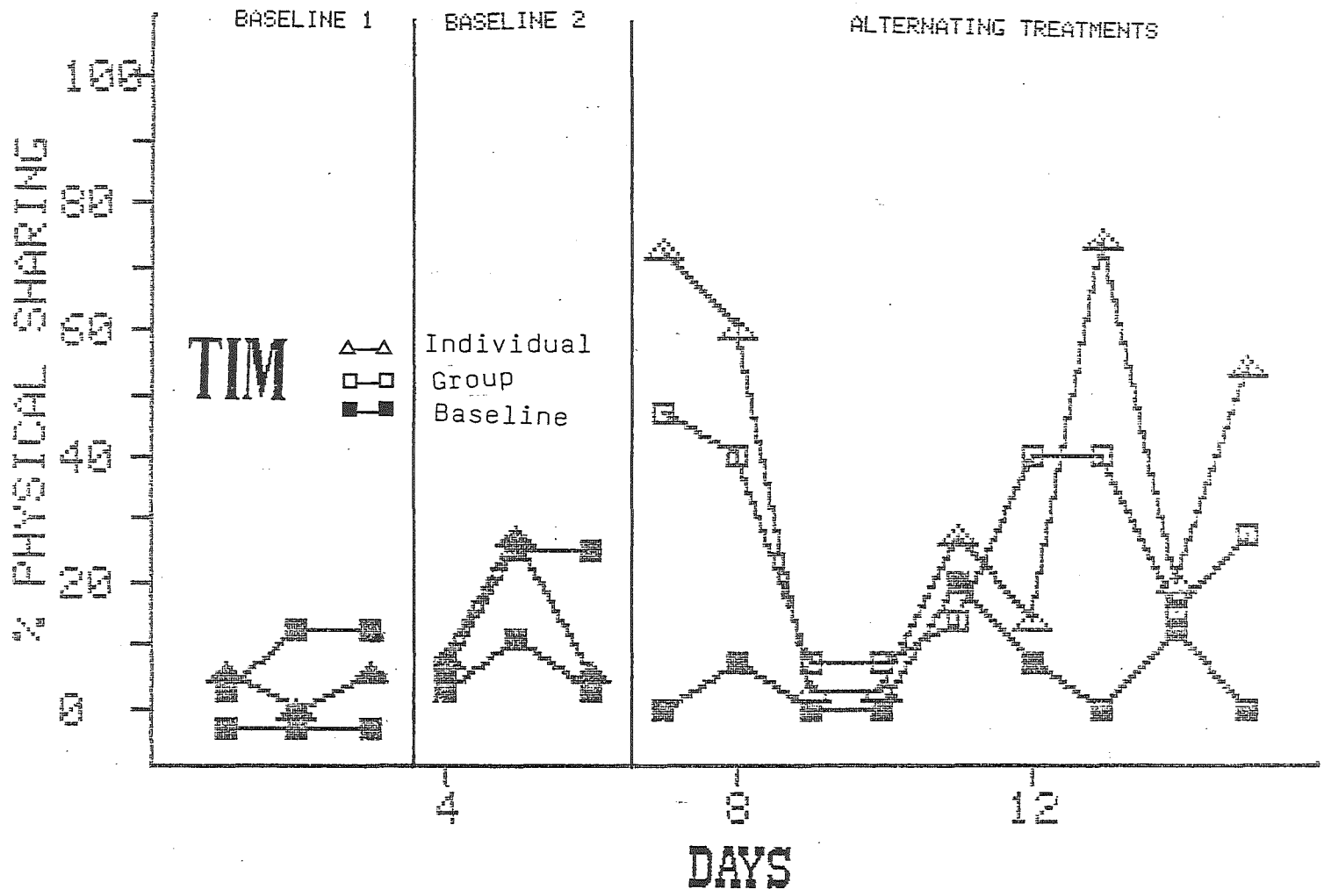
Figure Caption

Figure 4. Percent of physical sharing for each subject across all experimental conditions.


BASELINE 1
BASELINE 2
ALTERNATING TREATMENTS
GUY
Individual
Group
Baseline
DAYS


BASELINE 1
BASELINE 2
ALTERNATING TREATMENTS
% PHYSICAL SHARING
MARK
Individual
Group
Baseline
4
8
12
DAYS


BASELINE 1
BASELINE 2
ALTERNATING TREATMENTS
% PHYSICAL SHAPING
0
20
40
60
80
100
NIGEL
Individual
Group
Baseline
4
8
12
DAYS


BASELINE 1
BASELINE 2
ALTERNATING TREATMENTS
% PHYSICAL SHARING
TIM
Individual
Group
Baseline
4
8
12
DAYS

implementation of individual and group contingencies, it increased to 3.0% and 9.0%, respectively. For Nigel, the mean percent of verbal initiations ranged from 0.0 to 0.7 across baseline conditions of the experiment, increasing to 8.2 and 13.3 during the individual and group contingency conditions, respectively. Tim did not engage in any verbal initiations across all phases.

Insert Table 9 about here

Verbal Sharing - agreements

There were no verbal agreements throughout the experiment.

Share Refusal

Guy and Mark did not engage in share refusal at all. Nigel did not engage in share refusal except during Baseline 1 and Baseline 2 when it averaged 2.2%. The only time that Tim exhibited share refusal was during the alternating treatments when it averaged 1.5% during the individual and group contingencies and 0.7% in the baseline.

Grabbing

For Guy, the mean percent of grabbing ranged from 0.0 to 0.7 across all conditions of the experiment. Grabbing for Mark and Nigel was below 6% throughout the experiment. Tim did not grab at all.

Positive Social

No positive social behaviour was exhibited by any subject.

Table 9

The Mean Percentage of Play Behaviours Across Phases

	Baseline 1	Baseline 2	Individual Cont.	Group Cont.	Control
GUY					
Physical Sharing	0.0	0.7	76.3	69.6	1.5
Verbal Initiation	0.0	0.0	0.7	3.7	0.7
Verbal Agreement	0.0	0.0	0.0	0.0	0.0
Share Refusal	0.0	0.0	0.0	0.0	0.0
Grabbing	0.0	0.0	0.0	0.0	0.7
Positive Social	0.0	0.0	0.0	0.0	0.0
Inappropriate	0.0	0.0	0.0	0.0	0.0
App. Verbalization	9.6	6.0	11.1	9.6	8.2
Inactivity	14.1	21.5	5.9	5.2	10.4
Independent Play	86.0	77.8	15.6	23.7	87.4
MARK					
Physical Sharing	0.0	3.0	80.0	73.3	3.7
Verbal Initiation	0.0	1.5	3.0	9.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0	0.0
Share Refusal	0.0	0.0	0.0	0.0	0.0
Grabbing	5.2	1.5	0.0	0.0	0.7
Positive Social	0.0	0.0	0.0	0.0	0.0
Inappropriate	1.5	0.7	0.0	1.5	3.7
App. Verbalization	10.4	5.9	31.1	29.6	6.7
Inactivity	0.0	2.2	1.5	0.7	17.8
Independent Play	98.5	93.3	19.3	23.0	77.8
NIGEL					
Physical Sharing	4.5	13.3	65.2	46.7	5.2
Verbal Initiation	0.7	0.7	8.2	13.3	0.0
Verbal Agreement	0.0	0.0	0.0	0.0	0.0
Share Refusal	2.2	2.2	0.0	0.0	0.0
Grabbing	5.9	3.0	0.7	0.0	0.0
Positive Social	0.0	0.0	0.0	0.0	0.0
Inappropriate	4.5	1.5	3.7	1.5	0.7
App. Verbalization	20.0	20.7	47.4	26.7	20.0
Inactivity	1.5	1.5	0.7	0.7	0.7
Independent Play	91.1	87.4	34.8	51.1	94.1
TIM					
Physical Sharing	5.2	14.1	35.5	25.9	5.2
Verbal Initiation	0.0	0.0	0.0	0.0	0.0
Verbal Agreement	0.0	0.0	0.0	0.0	0.0
Share Refusal	0.0	0.0	1.5	1.5	0.7
Grabbing	0.0	0.0	0.0	0.0	0.0
Positive Social	0.0	0.0	0.0	0.0	0.0
Inappropriate	0.7	0.0	2.2	0.0	0.0
App. Verbalization	23.7	37.0	45.2	40.0	34.1
Inactivity	7.4	2.2	12.6	4.4	10.4
Independent Play	86.7	86.0	52.6	69.6	88.1

Inappropriate

Guy did not show any inappropriate behaviour and Tim engaged in it only during the individual contingency during 2.2% of the intervals observed. It was below 5% for Mark and Nigel throughout the experiment.

Appropriate Verbalization

All participants showed their highest levels of appropriate verbalization during the individual contingency condition. For Guy, the mean percent of appropriate verbalization ranged from 6.0 to 11.1 across all conditions and Mark's ranged from 5.9 to 31.1. Nigel and Tim exhibited much higher levels of appropriate verbalizations, ranging from 20.0% to 47.4% and 23.7% to 45.2%, respectively.

Inactivity

Guy exhibited high levels of this behaviour during the three baseline conditions, when the mean percentage of responses ranged from 10.4 to 21.5. During the individual and group contingencies inactivity decreased to 5.9% and 5.2% of intervals, respectively. Mark exhibited near-zero levels of inactivity in all conditions except Baseline 3 when it increased to 17.8% of intervals observed. Nigel showed close to zero levels of inactivity throughout the experiment. Tim's inactivity ranged from 2.2% in Baseline 2 to 12.6% in the individual contingency condition.

Independent Play

All participants exhibited high levels of independent play during

the baseline conditions but showed a dramatic reduction during the individual and group contingency conditions. For Guy, the mean percent of independent play decreased from 78 - 88 during the three baseline conditions to 15.6 and 23.7, respectively, during the individual and group contingencies. Mark's independent play decreased from 78% - 99% during the three baselines to 19% and 23%, respectively, during individual and group contingencies. Nigel's independent play ranged from 87.4% to 94.1% during baseline conditions and from 34.8 to 51.1% for the individual and group contingency conditions. Tim showed more consistent levels of independent play across experimental conditions, ranging from 53% to 88% of intervals observed.

Individual versus Group Contingencies

The data showed that both individual and group contingencies produced significant increases in physical sharing and appropriate verbalization. For three boys, verbal sharing-initiations showed a noticeable increase during the group contingency condition. Inappropriate behaviours (i.e., share refusal, grabbing, inappropriate, and inactivity) occurred at low levels or in some cases, showed a reduction when individual and group contingencies were introduced. Positive social behaviour and verbal agreements did not occur at all.

DISCUSSION

The results show that both individual and group reinforcement contingencies produced high levels of physical sharing. When

individual and group contingencies are compared, the data show that the individual contingency was more effective since all participants showed the highest levels of physical sharing when this contingency was in effect. This finding is interesting since previous studies which have compared individual and group contingencies have indicated either a clear advantage or minimal difference in favour of group contingencies. In the present experiment, the difference between individual and group contingencies was clear but not large, thus providing partial support for the findings of previous studies which revealed minimal differences (Axelrod, 1973; Frankosky & Sulzer-Azaroff, 1978; Grandy et al., 1973; Herman & Tramontana, 1971).

An explanation for the higher rates of sharing during the individual contingency is that the group contingency was less reinforcing and more frustrating for participants due to the fact that one of the subjects, an autistic child, often failed to share. Tim was the only participant who engaged in autistic behaviours including stereotypy, inappropriate verbalizations, inappropriate laughter, and social withdrawal. Tim appeared to to be uninterested and unresponsive to the reward conditions imposed during the experiment. The data showed that Tim shared at lower rates than the other three participants during both individual and group contingency conditions. According to the group contingency conditions, no participant was eligible to receive a reward if Tim failed to share. This situation appeared to create antagonism between the participants. Anecdotal evidence suggested a great deal of frustration occurred on Mark's part due to the unwillingness of Tim to share. During the group contingency sessions, Mark made comments first to encourage Tim then

later to threaten Tim to share. Nigel behaved towards Tim in a similar manner.

The data show that verbal initiations occurred at highest levels for Guy, Mark, and Nigel during the group contingency condition. These data provide support for the suggestion that three boys found it more difficult to access reinforcement during the group contingency and hence shared less. It is possible that at certain times they may have given up trying to share when it was obvious that Tim was not doing so. On the basis of these findings, it appears that a group contingency is less effective when one or more participants is autistic. In addition, there may be negative effects such as negative or aggressive peer interactions which occur as a result. It is recommended that under these conditions, an individual contingency is employed instead.

One hypothesis which is relevant to the latter finding is that subject characteristics and peer interaction patterns may influence the effectiveness of group contingencies. Greenwood and Hops (1981) suggested that group-oriented procedures are less effective when all members of the group are low social responders. This suggestion has direct relevance to the present experiment in which mentally retarded children were studied. It is possible that these children did not have the resources with which to tutor or motivate Tim and hence they resorted to verbal encouragement and later, to threats. Hayes (1976) suggested that low-status peers are more likely to be influenced by peers during group contingencies. The present findings suggest that group characteristics are important in determining the success of the various contingencies and that such characteristics need futher

examination.

There is anecdotal evidence to suggest that group contingencies may facilitate positive social interactions and a higher degree of cooperation between subjects than under individual contingencies. Many studies have demonstrated that group contingencies enhance cooperative behaviour among participants whereas individual contingencies encourage solitary behaviour (see Bryan, 1975). Peers have been reported to provide tutoring and social consequences to other group members when group contingencies are in effect (e.g., Axelrod, 1973; Schmidt & Ulrich, 1969).

Kazdin and Geesey (1977) have noted the important role of children's cognitions for indirectly influencing their behaviour during group contingencies. In particular, the fact that the target subject knows that he or she is earning for his or her peers and that they in turn may show their approval or disappoval may be important regardless of whether the subject actually receives any peer consequences for his or her performance. The degree of cooperation, spontaneous tutoring, and peer reinforcement may well be a function of: 1) the type of group contingency used (dependent versus interdependent), 2) the type of subject population (e.g., mentally retarded children versus normal children), and 3) the type of target behaviour (e.g., academic skills versus social interaction). In addition, contingencies which maximize positive rather than coercive peer interactions need to be identified.

One positive collateral behaviour, appropriate verbalization, increased during the individual and group contingency conditions. No other studies could be found which investigated the effects of

training sharing on verbal behaviour. However, this finding is consistent with related studies which showed that the rate of appropriate verbalization increased when independent or social play was reinforced (Buell et al., 1968; Keogh et al., 1984; Nordquist & Bradley, 1973). Three undesirable behaviours, share refusal, grabbing, and inappropriate behaviour, showed no consistent changes throughout the experiment and remained at low levels for all participants.

EXPERIMENT 6

Sharing represents an important play skill which has many positive side effects. One obvious advantage of sharing is that it facilitates social interaction and leads to the reciprocation of positive social responses by peers (Tremblay et al., 1981). In addition, sharing may enhance the cognitive and verbal development of children. There is evidence to suggest that children who fail to acquire sharing skills will have difficulties with later social adjustment (see Bryant & Budd, 1984). One group who have less likelihood of acquiring sharing skills are mentally retarded children. These individuals often display serious social skills deficits and in contrast to their normal peers are unlikely to engage in sharing spontaneously. Their play is often characterized by repetitive toy manipulations, independent activity; negative social behaviour, stereotypy, and other inappropriate responses. Passive behaviours including inactivity and social withdrawal are also common. Due to these behavioural excesses and deficits mentally retarded children may require specific training before they participate in group play activities. It is particularly important that mentally retarded persons learn to share since most of this group will later reside in community group homes where they will be expected to share household items and interact positively with each other.

In recent years, researchers have taught children to share using a wide range of behavioural techniques including reinforcement (Warren et al., 1976), positive practice (Barton & Osborne, 1978), strategic placement (Jason et al., 1980; Strain, Shores, & Timm, 1977),

comprehensive training packages (Barton, 1981; Barton & Ascione, 1979; Bryant & Budd, 1984), and correspondence training (Rogers-Warren & Baer, 1976, Rogers-Warren et al., 1977). This research has indicated that behavioural techniques are effective in the facilitation of sharing. Although sharing studies to date have focused largely on children of normal intelligence (see Barton, 1982), there are some studies in which developmentally disabled children were taught to share (Bryant & Budd, 1984; Cooke & Apolloni, 1976; Knapzyck & Yoppi, 1975; Peck et al., 1978; Strain, 1975). Collectively, these studies indicate that physical sharing can be facilitated via the use of behavioural techniques. However, Barton (1982) listed a number of problems with sharing research including the failure to assess for and program generalization, the repeated use of a small number of training procedures, and the lack of cost-benefit analyses. Other problems have also been noted. These include the fact that in many studies the length of the intervention phase was short and the level of sharing behaviour achieved was quite low (e.g., Bryant & Budd, 1984). In addition, researchers have often failed to assess verbal sharing or have combined verbal and physical sharing under the general category of sharing.

It has generally been assumed that increases in sharing will lead to concomitant increases in other appropriate behaviours such as positive social interaction and verbalization. However, the majority of sharing studies to date have failed to assess these effects (e.g., Barton, 1981; Barton & Osborne, 1978; Jason et al., 1980; Rogers-Warren & Baer, 1976; Strain, 1975). Hence, little is known regarding the positive side effects of sharing. In a recent investigation,

Bryant and Budd (1984) taught behaviourally handicapped children to share using a training package. Although a range of collateral behaviours (e.g., verbal sharing, refusals, aggression) were assessed, positive social behaviour was unfortunately omitted. Similarly, there are few studies which have investigated the effects of sharing on inappropriate behaviours (e.g., negative social interaction and share refusal). Thus, it is possible that as a child begins sharing, s/he also engages in higher rates of inappropriate behaviour. The failure to measure training effects on a wide range of collateral behaviours means that we have an incomplete understanding of changes that may concomitantly occur.

Correspondence training represents a relatively novel approach to the training of sharing in children. This procedure is based on the idea that a relationship exists between what people say they will do and what they actually do (see Paniagua & Baer, 1982). Correspondence training involves the reinforcement of a positive relationship between the subject's verbal and nonverbal behaviour. Three different types of correspondence training procedures have been developed, namely, the say-do procedure, the do-say procedure, and the show-do procedure. With the say-do sequence the subject first verbalizes his/her intentions regarding the target behaviour then he/she is given the opportunity to perform the target behaviour. Finally, the subject is reinforced if the verbal behaviour is consistent with the target behaviour. With the do-say sequence, the subject is provided with the opportunity to perform the target behaviour then he/she is asked to report whether or not s/he engaged in that behaviour. The subject is reinforced if the verbal report corresponds with the target behaviour.

The third procedure, show-do, is particularly useful for children with limited verbal repertoires or speech difficulties. With this method a trainer verbally describes the target behaviour to the subject and then asks him/her to demonstrate the behaviour. Next, the subject is given the opportunity to engage in the target behaviour. If s/he performs the behaviour as specified earlier then reinforcement is provided. With all three sequences, reinforcement is usually accompanied by a description of the behaviours which resulted in reinforcement (e.g., "You said you were going to share and you really did. Good boy."). No reinforcement is provided when noncorrespondence occurs. Thus, if the subject incorrectly states that s/he performed the target behaviour the trainer informs the child of his/her mistake and encourages him/her to do better at the next opportunity.

The early work by Luria (1961) provided the theoretical foundation for correspondence training. Luria discussed the relationship between verbal and nonverbal behaviour concluding that speech begins to exert a regulatory action over the child's behaviour between the ages of three to five years. Verbal behaviour does not naturally control nonverbal behaviour. Luria proposed that control is established as a result of the teaching process. However, it has been noted that the relationship between verbal and nonverbal behaviour is complex (Whitman et al., 1982, 1984). One study showed that the reinforcement of verbal statements resulted in an increase in the corresponding behaviour (Kurtz, Nelsworth, Goeke, & Hanson, 1976). In contrast, there are a number of investigations which have indicated that the reinforcement of children's verbalizations does not produce increases

in the actual behaviour (Brodsky, 1967; Risley & Hart, 1968; Karoly & Dirks, 1977). It has been suggested that this procedure is more effective with children who have previously been reinforced for matching their verbal and nonverbal behaviour (Burron & Bucher, 1978).

There is little information as to which of the three correspondence training procedures is more effective. In the two studies which compared say-do and do-say procedures, the say-do sequence proved to be superior (Israel & O'Leary, 1973; Karoly & Dirks, 1977). While no study has compared the effects of the show-do procedure against the other two sequences, the only study which evaluated its effects on its own (Whitman, Scibak, Butler, Richter, & Johnson, 1982) showed that show-do correspondence training reliably increased the on-task classroom behaviour of nonverbal retarded children. These effects continued during maintenance and transfer phases.

Correspondence training has a number of advantages over more traditional training methods. One is that only verbal behaviour needs be modified and this is more accessible than nonverbal behviour. There are many situations in which it is undesirable or impractical to monitor and reinforce motor behaviours. For example, the reinforcement of social responses in a classroom setting may be highly intrusive and distracting for other classroom members. In addition, this procedure could disrupt children's ongoing social interaction (Strain & Fox, 1981). Another positive effect is that it may enhance generalization and maintenance due to its indirect influence on motor behaviour (Israel, 1978). Rogers-Warren and Baer (1976) suggested that stimulus generalization may occur because the child's verbal

statements may affect the corresponding behaviour in a number of extra-training situations. In addition, it is likely that the procedure is valuable in the development of children's self-control (Israel & O'Leary, 1973).

The efficacy of correspondence training procedures has been demonstrated with a range of behaviours from story writing (Rumsey & Ballard, 1985) to sitting posture (Whitman et al., 1982). The say-do sequence has been effectively employed to facilitate appropriate classroom behaviours (Whitman et al., 1982), appropriate home behaviours (Baer et al., 1983), use of play materials (Israel & Brown, 1977; Israel & O'Leary, 1973), and social skills (Ballard & Jenner, 1981; Osnes et al., 1986).

Two published studies were found which investigated the effects of correspondence training with mentally retarded individuals. Whitman et al. (1982) conducted a series of three experiments which involved the use of correspondence training to improve the classroom behaviour of mentally retarded children. In Experiment 1, a say-do procedure was employed to reduce the out-of-seat behaviour of an educable mentally retarded girl (IQ = 70). Experiment 2 involved the use of a say-do procedure to teach appropriate sitting posture to four educable mentally retarded children (IQ range 72-87). In Experiment 3, show-do correspondence training was employed to teach on-task behaviour to four students, one whose IQ was untestable on standardized intelligence tests and three others whose IQs ranged from 56 to 68. The results indicated that correspondence training effectively increased appropriate classroom behaviours of mentally retarded children. Ralph and Birnbrauer (1986) employed a correspondence

training procedure in which both promises and reports of the target behaviour were reinforced. This procedure was effective in the facilitation of a specific social skill (appropriate entry and exit behaviour) for one mildly retarded man and two moderately retarded men. When correspondence training was implemented for behaviours which failed to reach the criterion in the generalization setting, these increased also.

Two studies have employed correspondence training to teach sharing. Rogers-Warren and Baer (1976) conducted a series of three experiments in which modeling and a do-say correspondence training procedure were used to facilitate sharing and praising in nonretarded preschool children. The results showed that sharing occurred most frequently when the subjects were reinforced for true reports rather than for any (true and false) reports. Rogers-Warren et al. (1977) evaluated the effects of five different training procedures on sharing in normal preschool children. The training components were modeling of sharing, modeling of the report of sharing plus reinforcement for that report, asking subjects to report their own behaviours, reinforcing any reports of sharing, and reinforcing only true reports of sharing. The results suggested that modeling alone and modeling in combination with reinforcement of the model's report of sharing were not sufficient to increase sharing. Self-reporting increased sharing in two subjects. The effect of reinforcement for any report of sharing varied. Some children reported truthfully throughout the condition and were reinforced. The final condition produced the highest rate of correspondence between saying and doing. As the authors noted, the design did not allow for independent evaluation of

each component but they advocated the use of the entire training package in any case.

In Experiment 5, it was found that edible reinforcement was effective for increasing the sharing of four mildly mentally retarded boys. However, there are some difficulties with edible rewards including the practical problems involved in dispensing them during training sessions, the interrupting on-going activity to provide reinforcement during training sessions, and the problems of maintaining treatment effects during generalization and follow-up sessions. Experiment 6 was designed to investigate the effects of a cognitive-behavioural procedure which relied on social reinforcement only. Examination of the literature indicated that the say-do procedure has not previously been used to teach sharing, that neither the say-do nor the do-say procedure has been used to teach mentally retarded children to share, and there is some uncertainty as to whether this procedure will be effective with children who have significant cognitive deficits (see Whitman et al., 1982). Since correspondence training has been widely endorsed for its potential in facilitating generalization, a measure of genralization was included in the present experiment. A wide range of collateral behaviours were also assessed so that the effects of training could be asessed on both appropriate and inappropriate responding.

METHOD

Children and Setting

Eight children (four girls and four boys) participated in this

experiment. Seven of the participants had been classified as moderately mentally retarded according to AAMD criteria (Grossman, 1983). One child (Donald) was classified as mildly mentally retarded. The children attended a state-run special education school for mildly to severely mentally retarded children. Selection for the experiment was based on teacher opinion of which children were most in need of sharing skills. The children were aged between 6 and 11 years (mean = 8 years) and exhibited a range of behavioural excesses and deficits including aggression and noncompliance (e.g., Toni, Brent) and social isolation (e.g, Shane, Tracey, Corrina, Debbie). Table 10 provides further information concerning individual children. Motor, language, and cognitive problems were scored on a scale (from none to severe) which was compiled from teacher records and test reports. One child received medication (Ritalin) during the experiment but this was discontinued after the first training phase.

The experiment was conducted in a 7m by 3m resource room adjoining the classrooms. One end of the resource room was furnished with a table and chairs. At the other end of the room was a large carpeted area where the children could play. A variety of play materials were available during all play sessions. These included a large Duplo set of trains, carriages, railway tracks, wagons, cranes, and people. Another Duplo set contained farm people, animals, cars, fences, and buildings which could be fitted together in a number of different ways. These multiple-item toys were selected because of their popularity, number of uses, and durability. In addition, multiple-item toys have been shown to facilitate sharing more than single-item toys (Partington, 1980).

Table 10

Descriptive Information About Participants

Name	Sex	Age(yrs)	Problems			
			Behaviour	Motor	Language	Cognitive
Donald	M	9	Tantrums, refusal to share	None	None	None
Toni	F	8	Autistic, noncompliant, aggressive, inattentive	Mild	Mod	Mod
Shane	M	8	Withdrawn, shy, stereotypic responses	Mod	Mod	Mod
Brad	M	7	Refusal to share, aggressive, inattentive	Mild	Mod	Mod
Brent	M	7	Swears, aggressive, noncompliant	Mild	Mild	Mild
Tracey	F	6	Withdrawn, autistic, stereotypic responses	Mod	Mod	Mod
Corrina	F	11	Withdrawn, shy, little speech	None	None*	None
Debbie	F	6	Withdrawn, shy, little speech	Mild	Mod*	Mild

* When child speaks.

Each child was given a counting device which consisted of beads on a wire loop. This device enabled the children to count the number of times they shared during a play session. Tape recorders were used to record the children's verbalizations during each play session and to record all conversations between trainers and children for training purposes. Observers used a stopwatch to record the duration of physical sharing throughout the play sessions. A range of sweets and stickers was available as a reward for participating in the play sessions.

Each pair of children visited the resource room once daily for approximately twenty minutes. Those children who could not attend every week-day were scheduled for extra sessions on the remaining days. During the 10-minute play period, the children were allowed to move freely around the play area as long as they did not leave the general vicinity or act aggressively towards their playmates or materials. If a child left the play area, he was asked to return and if this request was unheeded s/he was led back to the play area. When a child was severely disruptive s/he was asked to desist and if this request was ignored, the child was returned to the classroom. Fortunately, all the children valued highly their participation in the study, so this consequence was seldom delivered.

Generalization was assessed at regular intervals throughout the study. Generalization data were collected in the school hall which was substantially larger than the resource room and stored fewer materials. The same play materials were used in both the training and generalization settings.

Response Definitions

Eight behaviours were recorded during all play sessions:

1. Physical Sharing - initiation: When a child begins sharing with another child (e.g., when one child approaches another child and begins playing with the same toy, when one child hands a toy to another child). This category consists of nonverbal behaviour only.

2. Physical Sharing - ongoing: When a child allows another to use, take, or borrow a play material which the former was using (e.g., letting another child take a toy or two children simultaneously using the same toy).

3. Verbal haring - initiation: When a child verbally expresses the wish to share with another child (e.g., asking to share another child's toy, inviting another child to join a play activity or offering to share a play material with another child).

4. Verbal Sharing - agreement: When a child verbally accepts an invitation to share another child's play materials or when a child verbally agrees to share his own materials with another child.

5. Share Refusal: When a child indicates verbally or nonverbally that s/he is unwilling to share (e.g., protesting when another child tries to help, declining invitations to play with another child's toys, or, pushing another child away when s/he tries to share).

6. Inappropriate: When a child behaves in an aggressive, antisocial, or destructive way towards people or objects. This category includes grabbing toys off others, throwing play materials, and swearing.

7. Positive Social: When a child directs positive attention towards another child (e.g., physical affection, positive

verbalizations, and smiling). This category does not include eye contact per se.

8. Independent Behaviour: When a child is involved in a solitary activity (e.g., playing alone, staring into space, watching others).

Verbal responses were derived from audiotape recordings of the play sessions and appropriate and inappropriate responses were coded.

1. Appropriate: Any meaningful word or words which the child uses in an attempt to communicate with another child present (e.g., "Pass that block", "Leave that alone", "Go fast", "Yes"). This category also includes counting aloud and saying a person's name.

2. Inappropriate: Any verbalizations which involve swearing, shouting, screaming, or obvious negative meaning (e.g., "shut up", "I'll kill you", "shit", "I hate you"). This category includes arguing and negative teasing.

Data Collection and Reliability

The observation procedure followed the same format throughout the experiment. Data were collected five days a week during 10-minute play sessions. The children attended the play sessions in the following pairs: Donald and Toni, Shane and Brad, Brent and Tracey, and Corrina and Debbie. Each observer was assigned to train and observe one child in the pair. Two observers were present during each observation session. The experimenter attended all training and observation sessions in order to supervise and act as the reliability observer. A whole interval recording method was used in which each 10-minute observation period was divided into 60 10-second intervals.

The end of each 10-second interval was signalled through earplugs to the observers.

To assess for stimulus generalization of the children's behaviour observations were carried out in a second setting, namely, the school hall. Data collection procedures were identical to those used in the baseline phase of the experiment and the same play materials were used. Generalization probes were taken twice during each phase and every other criterion level.

The author and four advanced undergraduate psychology students served as the observers and trainers throughout the experiment. The observers received training in the use of the behavioural observation system until they reached a minimum of 85% agreement on four successive occasions. Interobserver reliability was calculated using an interval by interval agreement method. An agreement was scored when both observers scored the same behaviour in the same interval. For all low-occurrence behaviours (i.e., physical sharing-initiation, physical sharing-ongoing, verbal sharing-initiation, verbal sharing-agreement, share refusal, inappropriate, and positive social), reliability was calculated for occurrences only. To achieve this, the number of occurrence agreements was divided by the number of occurrence agreements plus occurrence disagreements, then multiplied by 100. For the high-frequency behaviour (i.e., independent behaviour) reliability was calculated for nonoccurrences only. This was achieved by computing the number of nonoccurrence agreements over the number of nonoccurrence agreements plus nonoccurrence disagreements and multiplying by 100.

Interobserver reliabilty for the audiotaped verbalization data was

assessed by dividing the number of occurrences for one rater by the number of occurrences for the other rater, and mulyiplying by 100.

Experimental Design and Procedures

A changing criterion design with reversal (Hartmann & Hall, 1976) was used to assess the effects of a say-do procedure on sharing and collateral behaviours.

Phase 1. During this phase (Baseline 1), each pair of children was brought to the resource room where they were instructed to play with the toys provided. A counter consisting of several beads on a wire loop was placed beside each child. Following the play session both children were allowed to choose a sweet or a sticker as a reward for participating. The observers said: "Thanks for playing today, (name of child)". This phase continued until three consecutive data points were stable.

Phase 2. In this phase (Training), training for sharing was introduced. Two pairs (Donald and Toni, Shane and Brad) received training for verbal sharing first and followed by training for physical sharing. The remaining two pairs (Brent and Tracey, Corrina and Debbie) received training for physical sharing during this phase and followed by training for verbal sharing.

Prior to the play session, each observer took her child aside for a prior-to-play talk. All talk sessions were tape recorded in order to determine the reliability of the independent variable. The observer said to the child: "Do you know how to ask (child's name) to

share the toys with you?" If the child indicated "No" or said nothing, the first example was provided. If the child indicated "Yes", s/he was asked to elaborate with the words: "O.K., how do you ask (child's name) to share?" The observer then answered "Yes" and "No" depending on whether the child was correct or not. If the child provided a correct answer, the observer went on to the second example. If the child answered incorrectly, the observer provided the first example.

Example 1. "You can ask Toni to share by saying - Can I play with you, Toni? So, how do you ask Toni to share? The observer waited until the child replied. If an incorrect answer was given, the observer repeated Example 1 until a correct answer was given. If necessary, the answer was broken into smaller segments according to the child's ability. Once Example 1 was answered correctly, the observer moved on to the next step in the procedure.

The observer then asked: "What's another way you can ask Toni to share the toys with you?" The observer listened to the child's reply before providing the second example. If the child supplied the correct answer, the observer provided the second example.

Example 2. "You can ask Toni to share by saying - Come and play with my toys, Toni. So, how do you ask Toni to share? The observer waited until the child replied. If an incorrect answer was given, the observer repeated Example 2 until a correct answer was given. If necessary, the answer was broken into smaller segments according to the child's ability.

The counter. The observer showed the child the counter which contained five plastic beads and said: "This is a counter. Every time

you ask Toni to share, you should move one bead over to here, like this" (observer demonstrates). "Now you try" (child moves a bead over). "Good. Now say you just asked Toni to share, what do you do next? Show me." (Child moved a bead over). The observer then said: "Pretend you just said to Toni - Can I play with you? show me what you would do next." The child demonstrated moving a bead over. If the child failed to move a bead over at any stage, the observer provided the verbal prompt: "Move a bead over". If the child failed twice in a row, the entire counter procedure was repeated. Finally, the observer said: "Now remember to move a bead over each time you ask Toni to share the toys with you."

During the 10-minute play session, each observer recorded the behaviour of the child she worked with. Play sessions were also tape recorded in order to assess training effects on the children's verbalizations. If a child initiated a verbal share, the observer responsible for that child would say: "Donald, move a bead over because you just asked Toni to share." Verbal shares which were ignored or rejected by the other child were still counted as verbal shares and the child was permitted to move a bead over. However, if a child attempted to move a bead over for the wrong reason, s/he was told: "Donald, you can't move a bead over because you didn't ask Toni to share."

Following the play session, both children were allowed to choose a sweet or a sticker as a reward for participating. They were told: "Thanks for playing today, Donald." The observer then took the child aside and counted aloud the number of beads moved over. The observer then said: "Oh I see you asked Toni to share x (corresponding to the

number of beads moved over) times today (pointing to the beads) - You're a very good boy/girl!" (The observer smiled at the child and patted him/her on the back). If the child had not moved any beads over, the observer said: "I see you didn't ask Toni to share today" (the observer pointed to the beads with a disappointed look), "See if you can try harder tomorrow."

Phase 3. During this phase (Correspondence Training) four children, one child from each pair, received correspondence training and the other children (i.e., Toni, Brad, Tracey, and Debbie) continued to receive training as before. The procedure for these children was identical to that of the previous phase (phase 2). For those children who received correspondence training, a criterion number of verbal shares was imposed. The following details are relevant to the correspondence-trained children only.

Prior to each play session, the correspondence-trained child was taken aside by the observer and asked if s/he knew how to ask the other child to share. As in Phase 2, the two examples of asking to share were then provided, and the counter explained to the child. In addition the child was now required to state how many times s/he would verbally share in the following play session. For this purpose, the observer placed the criterion number of beads on the child's counter and said: "How about asking Toni to share today? Do you think you can do that?" When the child agreed, the observer would say: "Can you ask Toni to share x (= criterion number) times today?" When the subject agreed, the observer said: "So how many times are you going to ask Toni to share today?" If the child answered correctly, the observer said "Yes". If the child gave an incorrect answer, the observer

supplied the correct answer before repeating the question. This procedure was carried out until the child had answered correctly. Finally, the child was reminded to move a bead over each time s/he asked the other child to share.

During the play sessions, both children were reminded to move a bead over after initiating a verbal share. Both children received a sweet or a sticker at the end of the play session, with the words: "Thanks for playing today."

Following the play session, the observer took the child aside and said: "You said you were going to ask Toni to share x times and you did." (The observer pointed to the beads) "You're a very good boy/girl!" The observer smiled at the child and patted him/her on the back. If the child had not moved the criterion number of beads over, the observer said: "You said you were going to ask Toni to share x times, but you didn't really, did you?" (The observer pointed to the beads with a disappointed look) "See if you can try harder tomorrow."

The initial criterion number of verbal shares was determined by the child's performance during the training phase. If the frequency of verbal shares was consistently high during the training phase, the child began with a similar number for the correspondence training phase. A child could not move to the next criterion until s/he had equalled the present criterion or exceeded it by no more than two points, on three consecutive sessions. Children who did not receive correspondence training were given the same number of beads as their correspondence-trained partner at each criterion level, throughout the experiment.

Phase 4. During this phase (Baseline 2), all training procedures

were discontinued. The children were brought to the resource room and instructed to play with the toys provided. If they asked whether they could share, they were told: "See if you can play with the toys. We're not giving cuddles and smiles for sharing right now." A counter was placed beside each child. The baseline phase continued until verbal sharing had returned to low, stable levels.

Phase 5. In this phase (Training), training for physical sharing was introduced. Two pairs (Brent and Tracey, Corrina and Debbie) received training in physical sharing first, while the other two pairs (Donald and Toni, Shane and Brad) received training in verbal sharing first.

Training for physical sharing. Prior to the play session, each observer took the child aside for the prior-to-play talk. All talk sessions were tape recorded. The observer said to the child: "Do you know how to share the toys with Toni?" (the appropriate child's name was substituted for "Toni"). If the child indicated "No" or said nothing, the first example was provided. If the child indicated "Yes", s/he was asked to elaborate, with the words, "O.K., how do you share with Toni?" The observer then said "Yes" and "No" depending on whether the child was correct or not. If the child provided a correct answer, the observer went on to the second example. If the child answered incorrectly, the observer provided the first example.

Example 1. "You can share with Toni by going over to her and helping her play with her toys. So, how do you share with Toni?" The observer waited until the child replied. If an incorrect answer was given, the observer repeated Example 1 until a correct answer was given. If necessary, the answer was broken into smaller segments

according to the child's ability. Once Example 1 was answered correctly, the observer moved on to the next step in the procedure.

The observer then asked: "What's another way you can share with Toni?" The observer listened to the child's reply before providing the second example. If the child supplied the correct answer, the observer said "That's right!" and moved on to the section concerning the counter. If the child answered incorrectly, the observer provided the second example.

Example 2. "You can share with Toni by giving her some of your toys. So, how can you share with Toni?" The observer waited until the child replied. If an incorrect answer was given, the observer repeated Example 2 until a correct answer was given. If necessary, the answer was broken into smaller segments according to the child's ability.

The counter. The observer showed the child the counting beads and said: "This is a counter. Every time you try to share with Toni, you should move one bead over to here, like this" (observer demonstrates). "Now you try" (child moves a bead over). "Good. Now say you just tried to share with Toni, what do you do next? Show me." (Child moves a bead over). If the child failed to move a bead over at any stage, the observer provided the verbal prompt: "Move a bead over". The observer then said: "Pretend you just went over to Toni and helped her with her toys, show me what you would do next." The child demonstrated moving a bead over. If the child failed twice in a row, the entire counter procedure was repeated. Finally, the observer said "Now remember to move a bead over each time you try to share the toys with Toni."

During the 10-minute play session, each observer recorded the behaviour of the child she worked with. Play sessions were also tape recorded in order to assess training effects on the children's verbalizations. If a child physically shared, the observer responsible for that child would say: "Donald, move a bead over because you just shared with Toni." Attempts to share which were refused by the other child were still counted as physical shares, and the child was permitted to move a bead over. However, if a child attempted to move a bead over for the wrong reason, s/he was told: "Donald, you can't move a bead over because you didn't share with Toni."

Following the play session, both children were allowed to choose a sweet or a sticker as a reward for participating. They were told: "Thanks for playing today, Donald." The observer then took the child aside and counted aloud the number of beads moved over. The observer said: "Oh, I see you shared with Toni x (number of beads) times today (pointing to the beads) - You're a very good boy/girl!" (smiling at the child and patting him/her on the back). If the child had not moved any beads over, the observer said "I see you didn't share with Toni today" (pointing to the beads with a disappointed look) "See if you can try harder tomorrow."

Phase 6. Correspondence training. Those children who received correspondence training previously (i.e., Donald, Shane, Brent, and Corrina), were the ones who received it again in this phase. The remaining children continued to receive training as described in phase 5 of the experiment. These children were Toni, Brad, Tracey, and Debbie. For those children who received correspondence training, a

criterion number of physical shares was imposed. The following details are relevant to the correspondence-trained children only.

Prior to each play session, the correspondence-trained child was taken aside by the observer and asked if s/he knew how to share with the other child. As in phase 5, the two examples of sharing were then provided and the counter was explained to the child. In addition, the child was now required to state how many times s/he would physically share in the following play session. For this purpose, the observer placed the criterion number of beads on the child's counter and said: "How about sharing with Toni today? Do you think you can do that?" When the child agreed, the observer said: "Can you share x (= criterion number) times today?" When the subject agreed, the observer said: "So how many times are you going to share with Toni today?" If the child answered correctly, the observer said "Yes". If the child gave an incorrect answer, the observer supplied the correct answer before repeating the question. This procedure was carried out until the child had answered correctly. Finally, the child was reminded to move a bead over each time s/he tried to share with the other child.

During the play session, both children were reminded to move a bead over after sharing. Both children received a sweet or a sticker at the end of the play session, with the words: "Thanks for playing today."

Following the play session, the observer took the child aside and said: "You said you were going to share with Toni x times and you did." (The observer pointed to the beads) "You're a very good boy/girl!" The observer smiled at the child and patted him/her on the back. If the child had not moved the criterion number of beads over,

the observer said: "You said you were going to share with Toni x times today, but you didn't really, did you?" (The observer pointed to the beads with a disappointed look) "See if you can try harder tomorrow."

The initial criterion number of physical shares was determined by the child's performance during the training phase. If the frequency of physical shares was consistently high during the training phase, the child began with a similar number for the correspondence training phase. A child could not move to the next criterion until s/he had equalled the present criterion or exceeded it by no more than two points, on three consecutive sessions. Children who did not receive correspondence training were given the same number of beads as their correspondence-trained partner throughout the experiment.

Generalization. Generalization was assessed at regular intervals throughout the experiment. The children remained in their usual pairs for these observations, and the same play materials were used as in the training sessions. Data collection procedures were identical to those used during baseline, except that they took place in a new setting. The counters were available for the children's use.

RESULTS

The mean percent of interobserver agreement across the experiment ranged from 88 to 99 for individual behaviours. The ranges and mean reliability scores for each behaviour are presented in Table 11. The reliability score was occasionally rendered 0% by the formula used. This occurred when one observer recorded 59 out of 60 occurrences, and the other recorded 60 out of 60 occurrences, resulting in a

nonoccurrence agreement of 0. That is, the observers agreed zero times on nonoccurrences. This score also resulted when the same figures were recorded for nonoccurrences.

Insert Table 11 about here

Figure 5 displays the number of physical and verbal shares for the eight children individually. Shares are represented in terms of real numbers so that a more direct interpretation of each child's adherence to the criterion can be made. (The criteria are also expressed in terms of whole numbers). The mean frequency of collateral behaviours for individual children is presented in Table 12.

Insert Figure 5 and Table 12 about here

The two categories of physical sharing are presented as a combined total since the criterion number of shares was determined from both behaviours. That is, both initiations and ongoing shares were accepted as contributing to the child's criterion number of physical shares during correspondence training. The child was permitted to move a bead over for either type of sharing since often no one child was responsible for initiating a physical share (i.e., both children would start playing together). Also, it would have been difficult for the children to discriminate between initiations and ongoing shares in order to move the beads. This problem would have necessitated a great number of interruptions and judgements from the observers as to which behaviours warranted the moving of a bead. For these reasons both

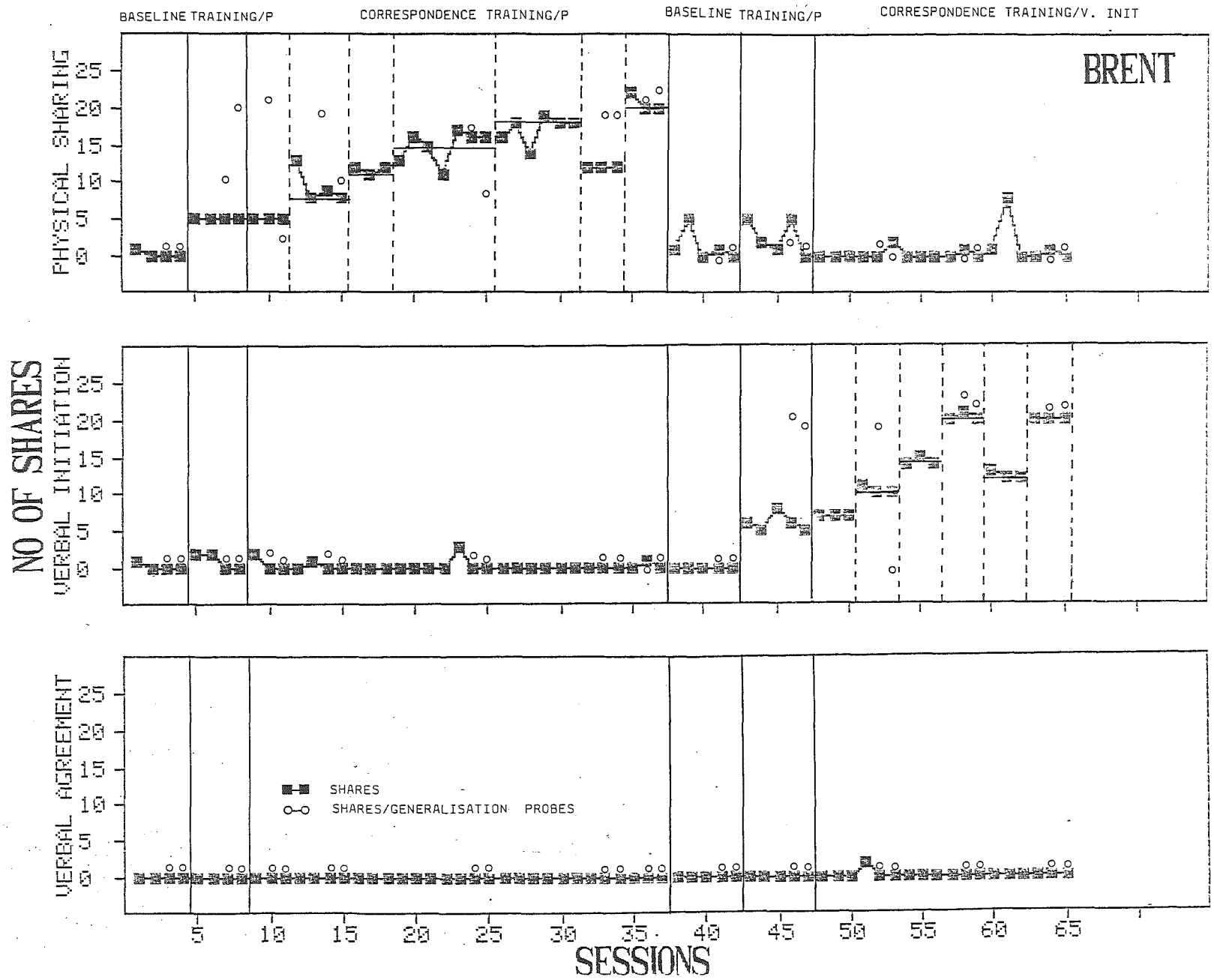
Table 11

Mean and Range of Interobserver Agreement Across all Behaviours and Experimental Conditions

Behaviour	Range	Mean Agreement (%)
Physical - initiation	0-100	96
Physical - ongoing	0-100	95
Verbal - initiation	67-100	98
Verbal - agreement	0-100	99
Share refusal	0-100	97
Inappropriate	0-100	93
Positive social	0-100	92
Independent	0-100	91
Appropriate verbalization	33-100	94
Inappropriate Verbalization	0-100	95
Silence	50-100	95
Other	0-100	88

Figure Caption

Figure 5. Number of verbal agreements, verbal initiations and physical shares across all experimental conditions.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CORRESPONDENCE TRAINING/P
BASELINE TRAINING/P
CORRESPONDENCE TRAINING/V. INIT
BRENT
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PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
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SHARES
SHARES/GENERALISATION PROBES
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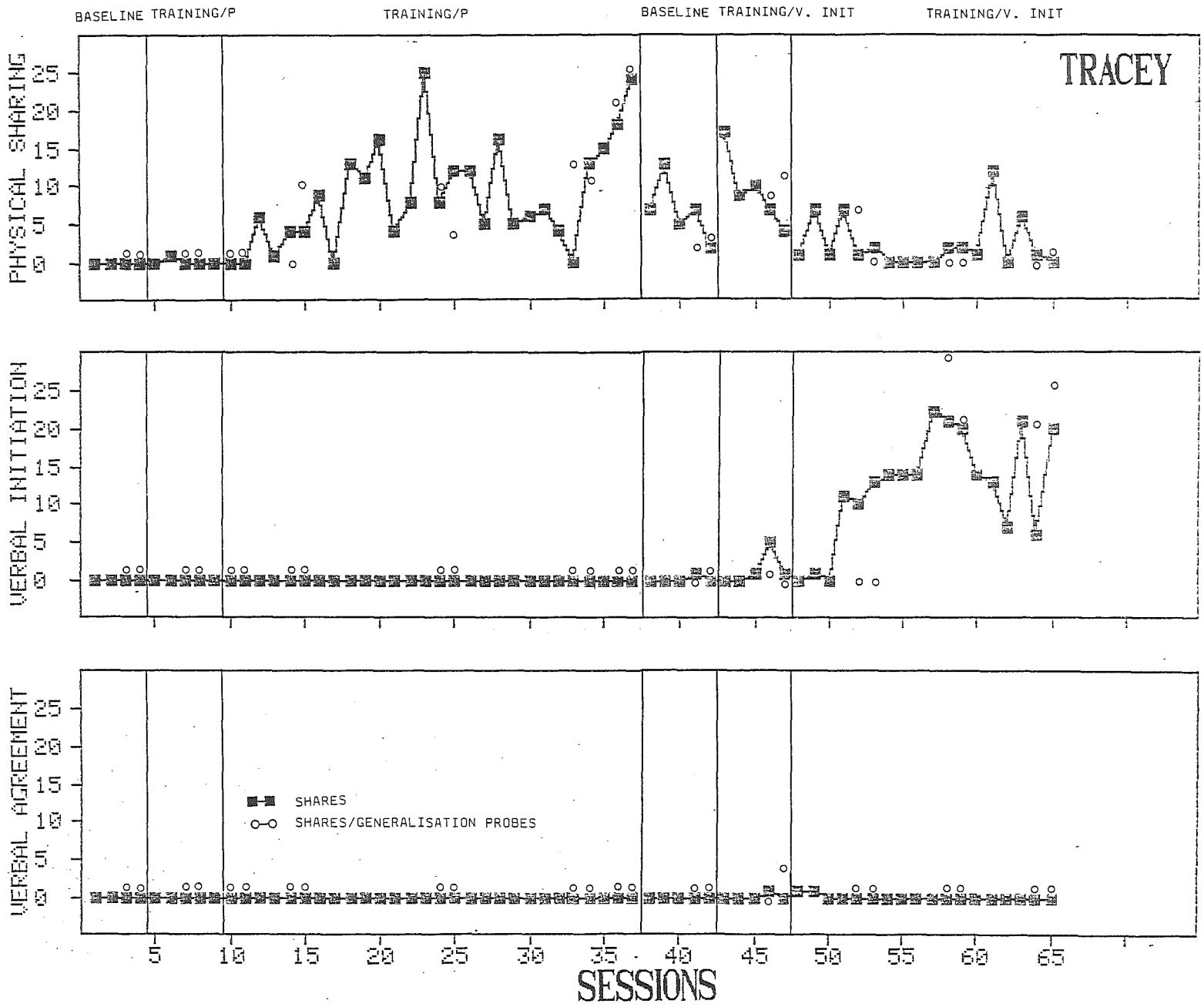
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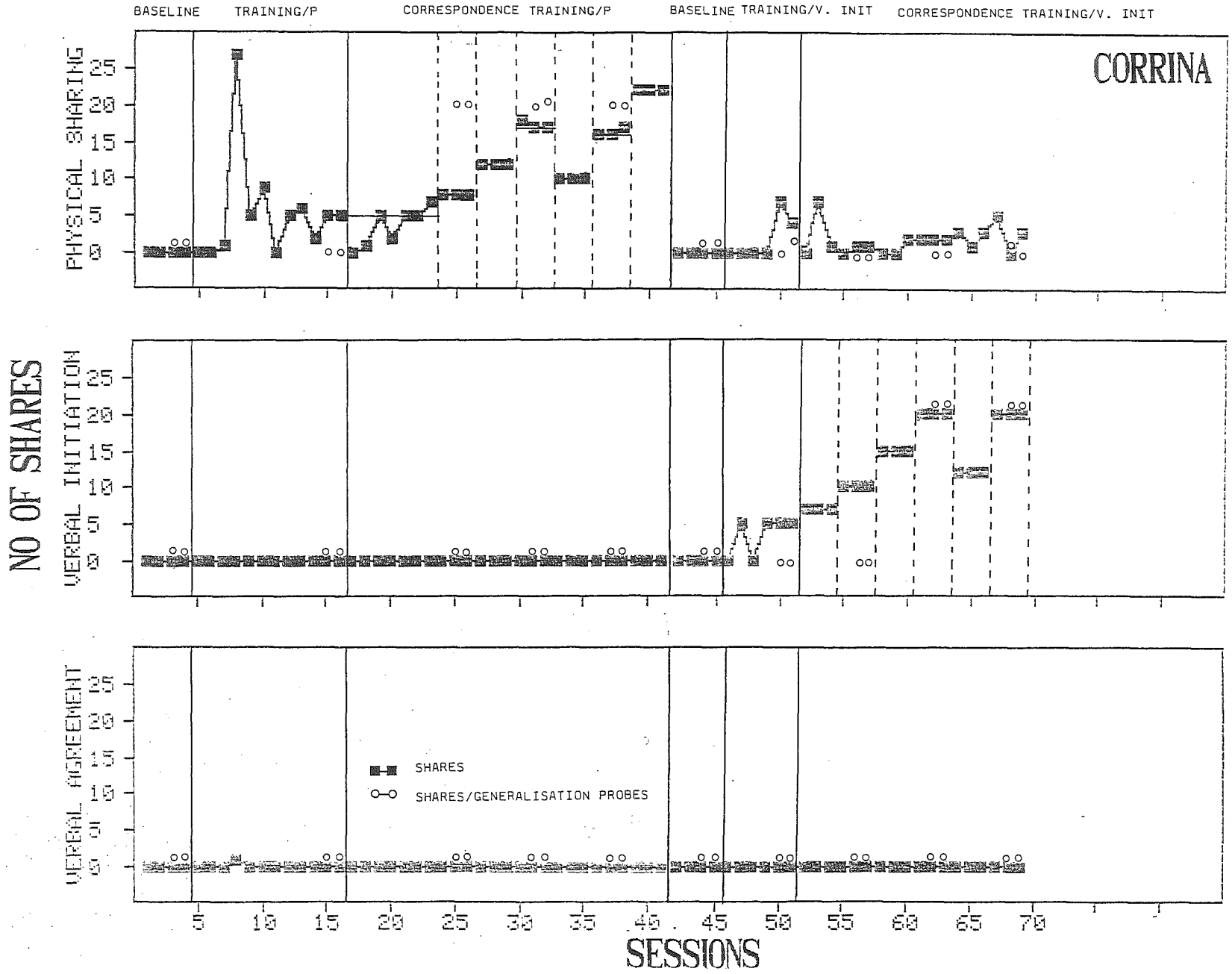
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SHARES
SHARES/GENERALISATION PROBES
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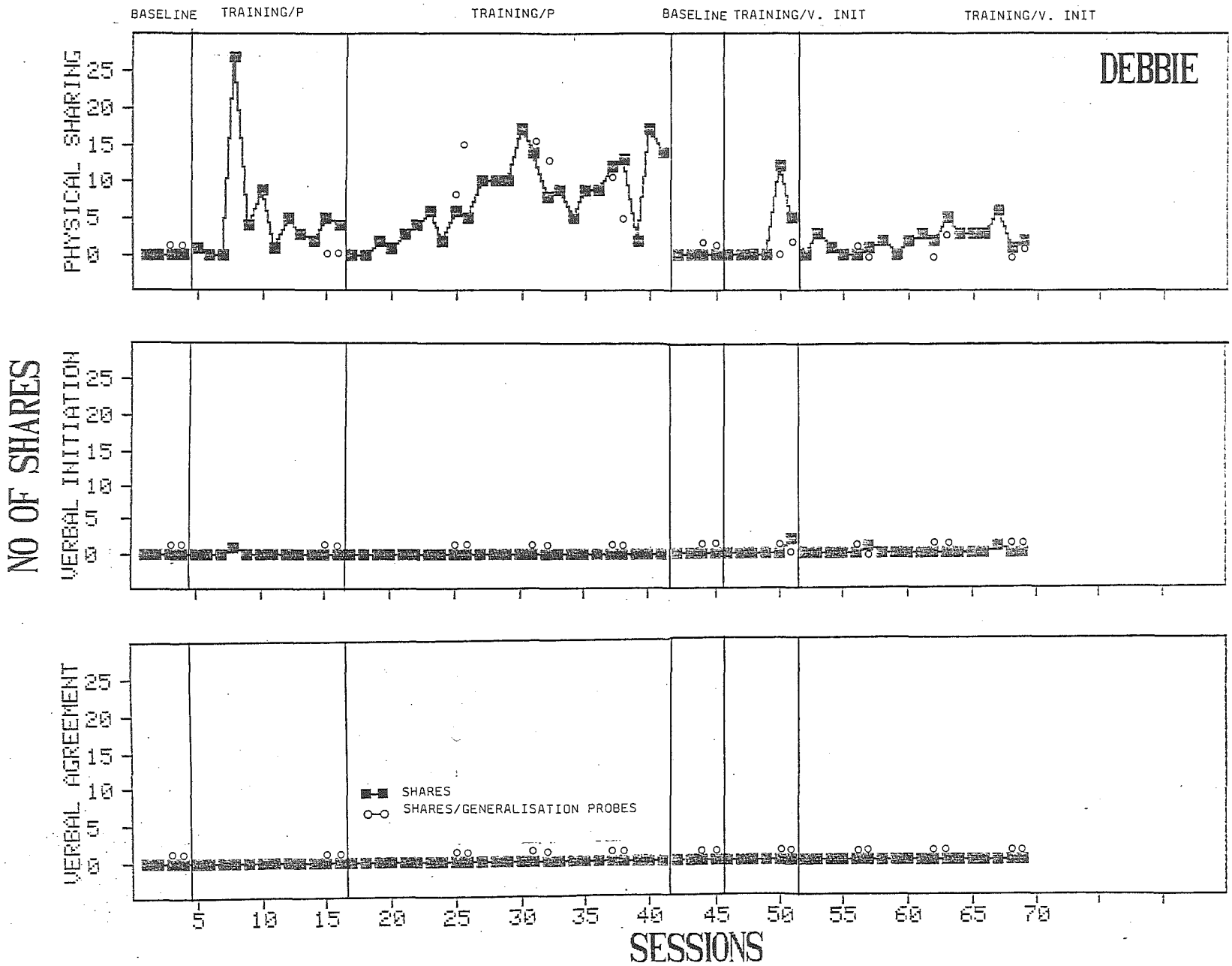
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SHARES
SHARES/GENERALISATION PROBES
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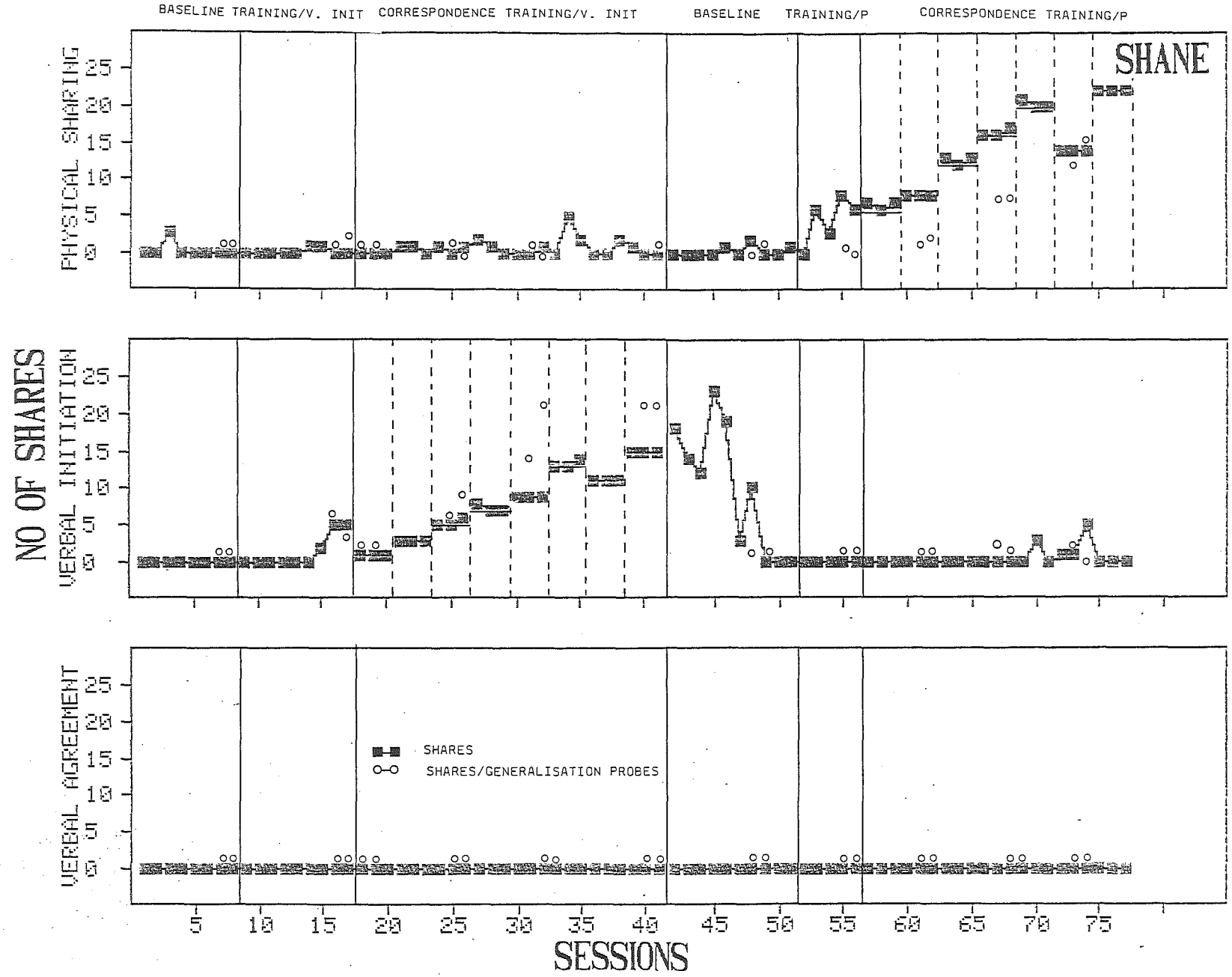
SESSIONS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BASELINE TRAINING/P
CORRESPONDENCE TRAINING/P
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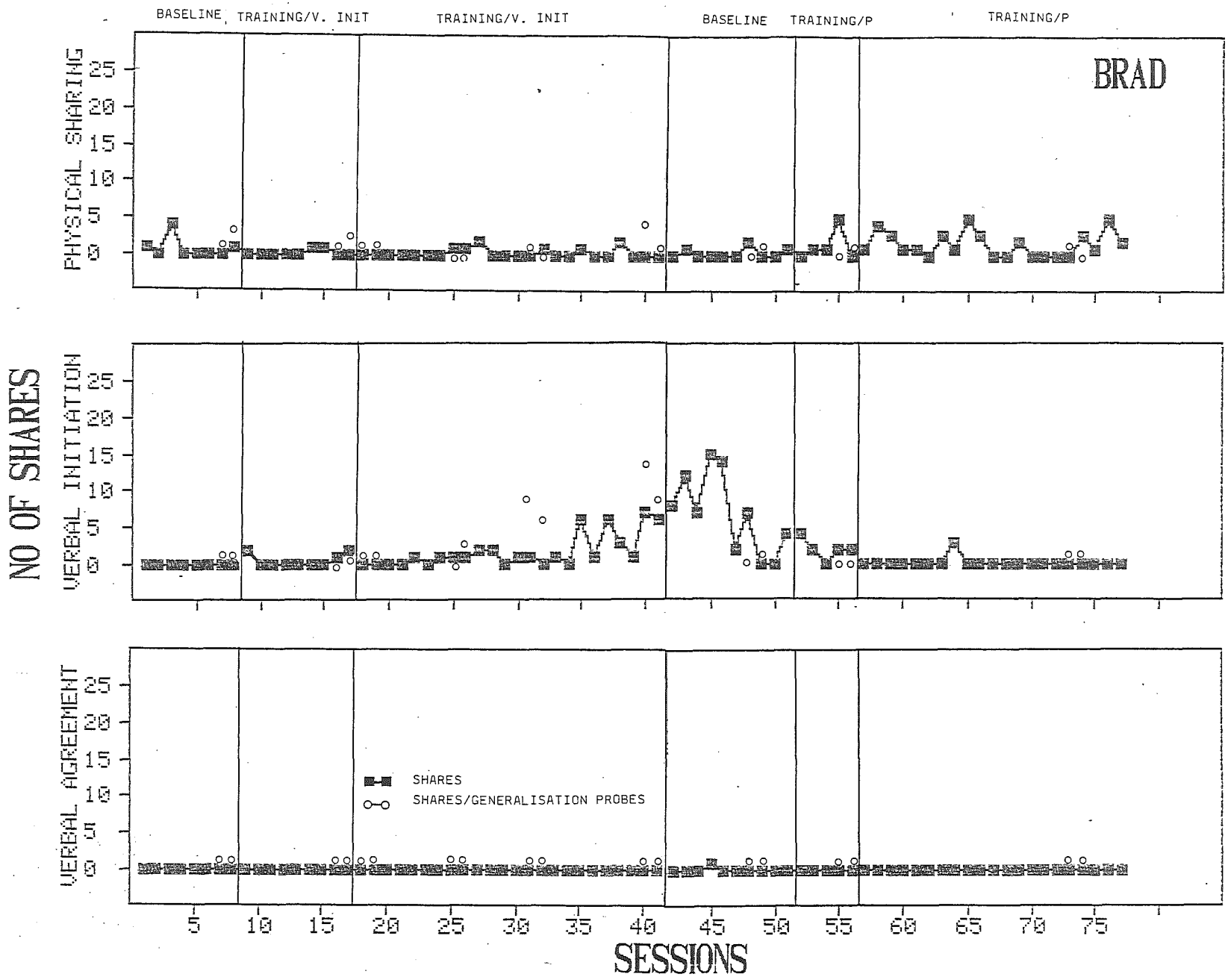
NO OF SHARES
VERBAL INITIATION
VERBAL AGREEMENT
SHARES
SHARES/GENERALISATION PROBES
SESSIONS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VERBAL AGREEMENT
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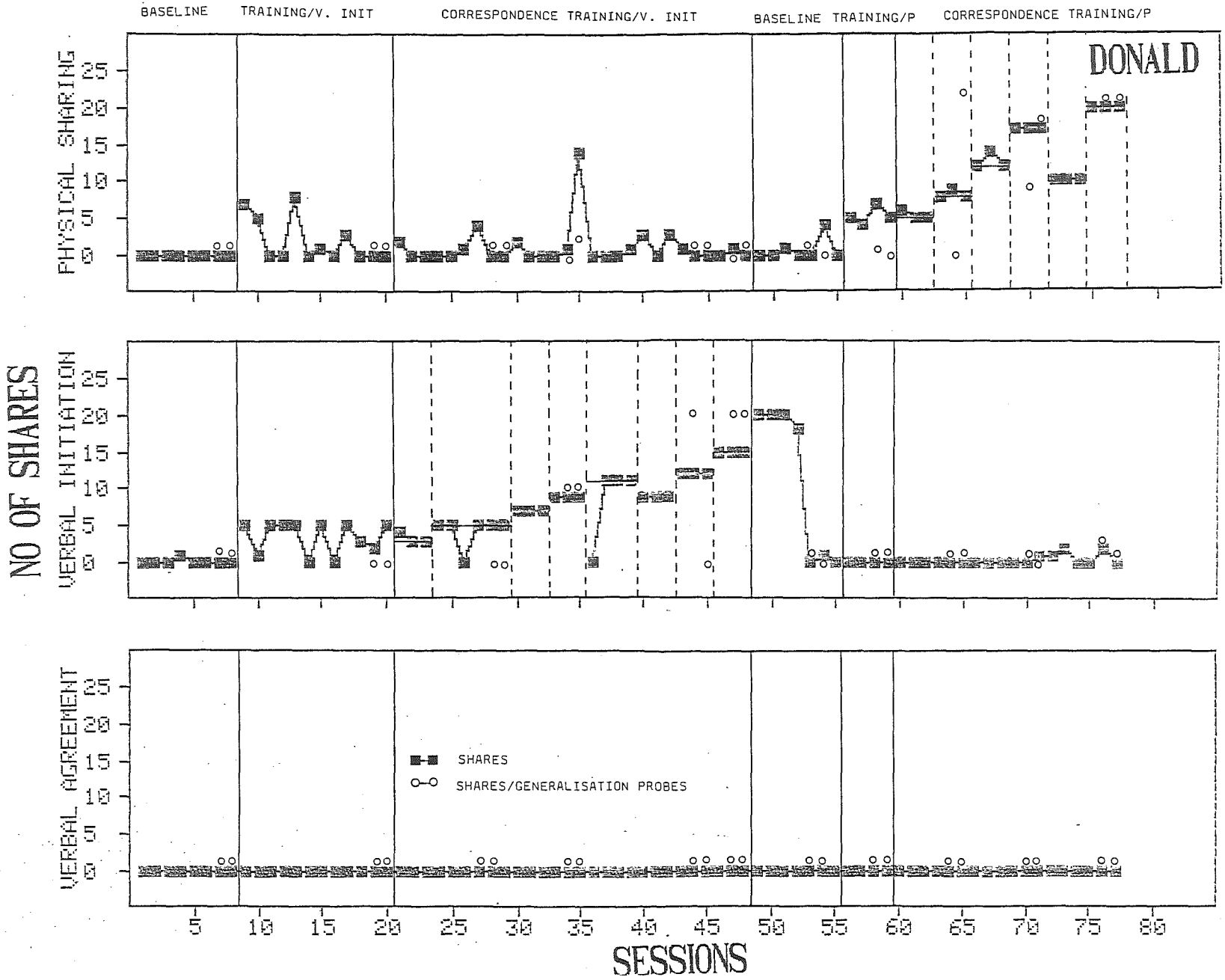
SHARES
SHARES/GENERALISATION PROBES
SESSIONS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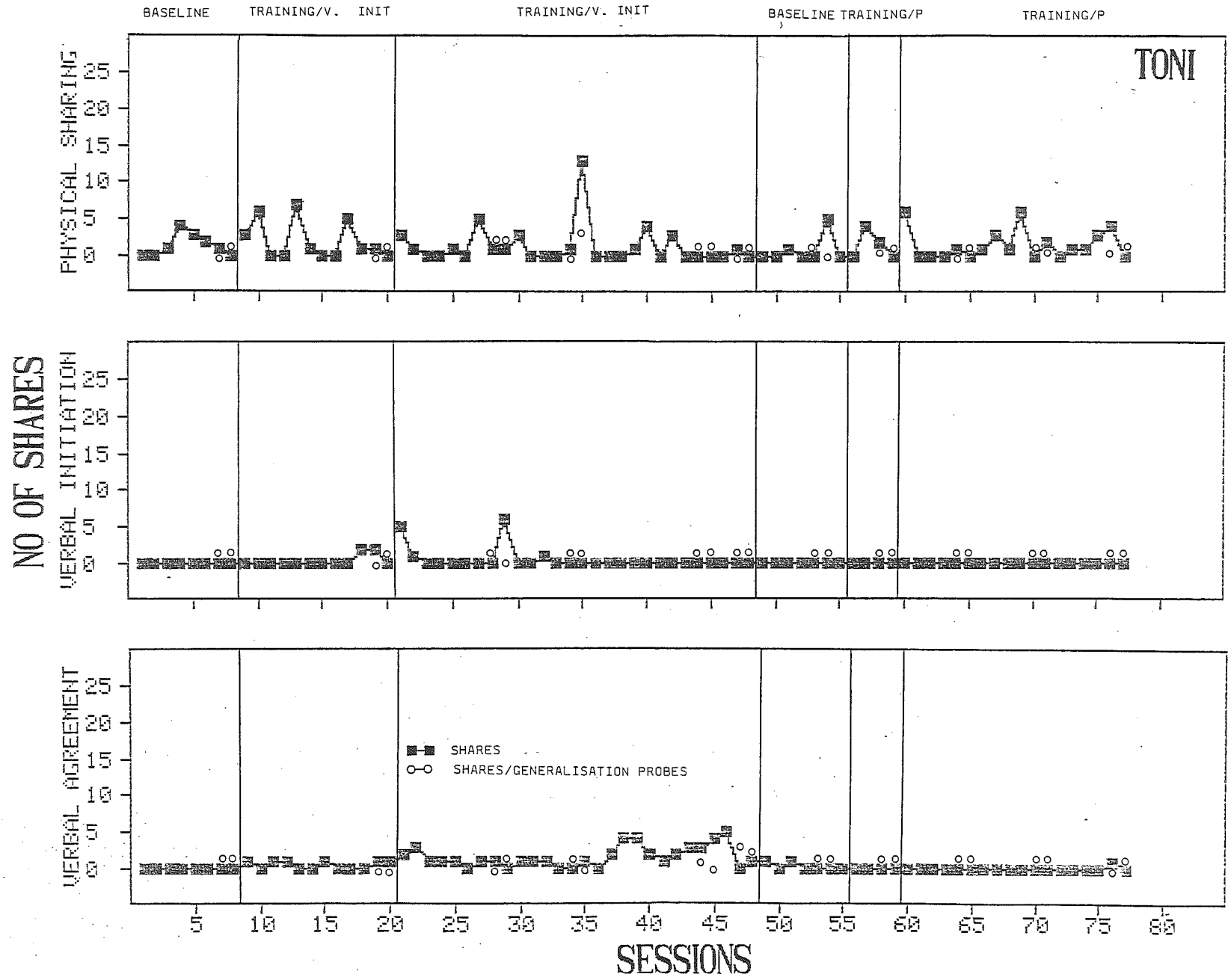
VERBAL AGREEMENT
NO OF SHARES
SHARES
SHARES/GENERALISATION PROBES
SESSIONS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TRAINING/V. INIT
BASELINE
TRAINING/P
TRAINING/P
TONI
PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
NO OF SHARES
SHARES
SHARES/GENERALISATION PROBES
SESSIONS

Table 12

Mean Levels of Collateral Behaviours Across Phases

BRENT

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.0	3.0	1.0	60.0
Training (Phys.)	0.0	3.3	0.5	60.0
Correspondence Criterion = 5	0.0	5.7	2.7	59.3
= 8	0.5	4.8	3.3	59.5
= 11	0.3	4.7	4.0	59.3
= 15	0.0	2.0	3.1	59.7
= 18	0.0	2.2	3.0	59.0
= 12	0.0	1.0	7.0	59.3
= 20	0.0	1.0	10.0	59.0
Baseline 2	2.6	10.0	1.4	60.0
Training (Verb.)	0.4	6.2	5.2	59.8
Correspondence Criterion = 7	0.3	6.7	1.3	60.0
= 10	0.0	3.3	12.7	60.0
= 14	0.0	2.0	3.0	60.0
= 20	0.0	1.7	3.7	60.0
= 12	0.0	1.3	1.0	60.0
= 20	0.0	1.0	4.0	59.6

Table 12

Mean Levels of Collateral Behaviours Across Phases

TRACEY

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.0	0.0	0.0	60.0
Training (Phys.)	0.0	0.0	0.3	60.0
Correspondence				
Criterion = 5	0.0	0.7	2.3	60.0
= 8	0.5	0.5	2.3	60.0
= 11	1.3	0.0	1.6	59.7
= 15	0.0	0.1	1.3	59.7
= 18	0.7	0.4	6.7	59.5
= 12	0.0	1.7	8.0	60.0
= 20	0.0	0.0	1.0	59.7
Baseline 2	0.0	2.0	0.4	60.0
Training (Verb.)	0.6	0.8	0.2	60.0
Correspondence				
Criterion = 7	1.0	1.7	0.0	60.0
= 10	0.0	0.0	9.3	60.0
= 14	0.0	0.7	1.0	60.0
= 20	0.0	0.7	2.0	60.0
= 12	0.0	0.0	0.7	60.0
= 20	0.0	0.0	0.0	60.0

Table 12

Mean Levels of Collateral Behaviours Across Phases

CORRINA

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.0	0.3	0.0	60.0
Training (Phys.)	0.0	0.0	0.0	57.9
Correspondence Criterion = 5	0.0	0.0	0.0	59.6
= 8	0.0	0.0	0.0	58.3
= 12	0.0	0.0	0.0	56.3
= 17	0.0	0.0	0.0	57.3
= 10	0.0	0.0	3.0	58.0
= 16	0.0	0.0	0.3	57.3
= 22	0.0	0.0	1.0	54.3
Baseline 2	0.0	0.0	0.0	60.0
Training (Verb.)	0.0	0.0	0.7	60.0
Correspondence Criterion = 7	0.0	0.0	4.7	60.0
= 10	0.0	0.0	2.3	60.0
= 15	0.0	0.0	2.0	60.0
= 20	0.3	0.0	1.7	60.0
= 12	0.0	0.0	3.7	59.3
= 20	0.0	0.0	4.0	59.7

Table 12

Mean Levels of Collateral Behaviours Across Phases

DEBBIE

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.0	0.8	0.0	60.0
Training (Phys.)	0.0	0.3	0.0	58.3
Correspondence Criterion = 5	0.1	0.0	0.0	60.0
= 8	0.3	0.0	0.0	59.7
= 12	0.3	0.0	0.0	59.3
= 17	0.0	0.0	0.0	58.3
= 10	1.0	0.0	2.3	58.0
= 16	0.3	0.0	0.0	58.0
= 22	0.3	0.0	0.0	60.0
Baseline 2	0.0	0.0	0.0	60.0
Training (Verb.)	0.0	0.2	0.3	60.0
Correspondence Criterion = 7	0.0	0.3	4.0	60.0
= 10	0.0	0.0	1.0	60.0
= 15	0.0	0.0	0.7	60.0
= 20	0.0	0.0	2.7	60.0
= 12	0.0	0.0	2.3	59.7
= 20	0.0	0.0	1.7	59.7

Table 12

Mean Levels of Collateral Behaviours Across Phases

SHANE

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	1.4	0.9	0.0	60.0
Training (Verb.)	0.3	0.3	0.0	60.0
Correspondence Criterion = 1	0.3	0.0	0.0	60.0
= 3	0.7	0.0	5.0	60.0
= 5	0.0	0.3	1.3	60.0
= 7	0.0	0.3	2.0	59.3
= 9	0.3	0.3	2.0	60.0
= 13	0.0	0.0	0.7	59.7
= 11	0.3	0.0	1.0	60.0
= 15	0.0	0.0	1.0	60.0
Baseline 2	0.0	0.2	0.9	60.0
Training (Phys.)	1.0	0.8	0.2	59.4
Correspondence Criterion = 5	0.0	0.3	0.7	58.0
= 8	0.3	0.1	1.3	60.0
= 12	0.0	1.0	0.3	59.3
= 16	0.0	0.0	2.0	57.3
= 20	0.0	0.0	0.7	57.3
= 14	0.0	0.0	0.3	58.3
= 22	0.0	0.0	1.0	56.3

Table 12

Mean Levels of Collateral Behaviours Across Phases

BRAD

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.4	0.3	0.3	60.0
Training (Verb.)	0.0	1.0	0.1	60.0
Correspondence				
Criterion = 1	0.0	0.7	0.0	60.0
= 3	0.0	1.3	3.3	60.0
= 5	0.3	2.0	0.7	60.0
= 7	2.0	0.3	0.3	59.7
= 9	3.0	0.0	0.0	60.0
= 13	1.3	0.0	0.0	59.7
= 11	0.3	1.7	0.0	60.0
= 15	0.0	3.3	0.0	60.0
Baseline 2	0.2	0.1	0.0	60.0
Training (Phys.)	2.8	4.0	0.0	60.0
Correspondence				
Criterion = 5	1.3	0.3	0.0	58.8
= 8	4.0	1.3	0.0	60.0
= 12	6.3	5.7	0.0	59.7
= 16	2.0	5.0	1.0	60.0
= 20	2.7	4.7	0.3	60.0
= 14	1.3	3.0	0.3	60.0
= 22	1.3	1.7	2.0	59.8

Table 12

Mean Levels of Collateral Behaviours Across Phases

DONALD

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.3	3.5	0.1	60.0
Training (Verb.)	0.5	0.5	0.0	58.3
Correspondence Criterion = 3	0.0	3.0	0.0	60.0
= 5	1.4	3.2	0.4	60.0
= 7	0.7	6.0	0.7	60.0
= 9	0.7	2.0	1.7	54.7
= 11	0.0	1.3	0.0	60.0
= 9	0.3	5.0	0.7	54.2
= 12	0.7	1.7	0.0	60.0
= 15	0.7	1.0	1.3	60.0
Baseline 2	0.3	0.3	0.0	60.0
Training (Phys.)	0.0	0.0	0.3	60.0
Correspondence Criterion = 5	0.0	0.0	0.3	59.3
= 8	0.0	1.0	2.0	60.0
= 12	0.0	0.7	1.0	58.3
= 17	2.0	0.3	0.3	60.0
= 10	0.0	4.3	1.3	58.3
= 20	0.3	2.3	3.7	56.7

Table 12

Mean Levels of Collateral Behaviours Across Phases

TONI

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.1	1.4	0.3	60.0
Training (Verb.)	0.2	0.8	0.4	59.3
Correspondence				
Criterion = 3	0.0	1.0	0.3	59.7
= 5	0.7	1.7	1.2	60.0
= 7	0.7	6.7	1.0	60.0
= 9	0.0	3.0	0.7	58.0
= 11	1.0	0.8	2.3	60.0
= 9	0.0	4.0	1.0	59.2
= 12	0.0	2.3	0.0	60.0
= 15	0.3	1.0	0.3	60.0
Baseline 2	0.0	0.5	0.2	60.0
Training (Phys.)	0.0	1.8	0.5	60.0
Correspondence				
Criterion = 5	0.0	2.7	0.3	59.3
= 8	0.3	2.7	2.0	60.0
= 12	0.0	0.3	1.3	59.7
= 17	1.3	4.0	1.3	60.0
= 10	0.7	4.3	0.7	60.0
= 20	0.0	4.7	1.0	59.0

initiations and ongoing physical shares were permitted in order to reach the criterion.

Physical Sharing (initiations and ongoing combined)

The four children who received correspondence training significantly increased their numbers of physical shares as a result. The remaining four children showed either little change in this behaviour (i.e., Toni and Brad) or significant training-related increases (i.e., Tracey and Debbie). For all children, the baseline number of physical shares was near-zero. The only exceptions were Toni and Brad, who physically shared a maximum of four times each in a baseline session, and Shane, who shared three times during one baseline session. Thus, prior to the implementation of training, physical sharing occurred at very low levels only. Once training for physical sharing was implemented for Brent and Corrina, the number of physical shares rose dramatically for these two children. Brent consistently shared five times per session, while Corrina's number of shares remained close to zero for three training sessions before increasing to 26 shares on the fourth session. The number of shares then decreased and varied between 0 and 9 shares for the remaining eight sessions. When correspondence training was introduced for physical sharing, both Brent and Corrina increased their number of physical shares consistent with each criterion change. With the exception of the first criterion level which fluctuated somewhat, Corrina's number of physical shares adhered closely to each criterion level, never falling below the set criterion. Brent's physical sharing was more variable and failed to meet the criterion four times

during the correspondence training phase. During the reversal periods, both Corrina and Brent reduced their number of shares consistent with the criterion. Once the second baseline phase was introduced for Corrina and Brent, the number of shares immediately showed a dramatic reduction, with the highest number of physical shares for any baseline session being 5 (Brent). Although higher than the baseline 1 level, physical sharing occurred at low rates for the remainder of the experiment in both Brent and Corrina's cases.

The partners of Brent and Corrina, namely, Tracey and Debbie, displayed variable levels of physical sharing throughout the correspondence training phase, with the general trend increasing for both children. Tracey's number of shares during the training phase had been near-zero, while Debbie's rate of sharing had increased but was extremely variable during the same phase. Both Debbie and Tracey did not share during baseline 1, so the number of shares displayed in phase 3 of the experiment was considerably increased. For the final two phases of the experiment, when their partners were receiving training for verbal sharing, Debbie and Tracey showed lower rates of physical sharing. However these were still considerably higher than the initial baseline phase.

The remaining four children (Donald, Toni, Shane, and Brad) received training for verbal sharing first, hence their levels of physical sharing remained very low during the first four phases of the experiment. However, Donald and Toni physically shared 14 times during one correspondence training session and their overall number of physical shares did appear to have increased over baseline levels. In the second half of the experiment, when training for physical sharing

was introduced, Donald and Shane both showed immediate increases in the number of physical shares. The correspondence training provided to Donald and Shane resulted in criterion-consistent changes in physical sharing for both children. No data points for either child fell below the criterion number of physical shares during the entire correspondence training phase. During reversal, Donald and Shane lowered their number of shares to exactly the criterion level. Their partners (Toni and Brad) showed variable but low levels of physical sharing throughout the experiment. Overall, there was little change in this behaviour for Toni and Brad. The training which Donald and Shane received appeared to have little effect on Toni and Brad's performance.

Duration of Physical Sharing

The mean duration of physical sharing for each child is presented in Table 13. For Brent and Tracey, the mean duration of physical sharing appeared to be slightly longer when correspondence training was provided for physical sharing. The only exception was a maximum duration of 8.4 seconds for Brent at the final criterion level of correspondence training for verbal sharing. Corrina and Debbie also showed longer durations of sharing during correspondence training for physical sharing. In general, the duration of sharing averaged 3 seconds during training and correspondence training for physical sharing, while it ranged from 0 to 2.7 seconds in all other phases for both girls. For both Shane and Brad, the mean duration of sharing varied considerably across phases, ranging from 0 to 5.4 seconds for Shane and from 0 to 9.9 seconds for Brad. No obvious trends were

apparent. Donald and Toni also displayed variable durations of sharing. In general, the mean duration of sharing was slightly higher during all training and correspondence training phases when compared with baseline measures.

Insert Table 13 about here

Verbal Sharing - Initiations

For the four children who received correspondence training, the number of verbal initiations increased consistent with each criterion. For the other children, the number of verbalizations remained close to zero (i.e., Toni, Debbie) or increased as a result of training (Brad, Tracey). Verbal initiations were seldom exhibited during the initial baseline phase, the highest number of these responses being 1 (for Donald and Brent). The two children who received training for verbal initiations first (Donald, Shane), showed a significant increase in this behaviour during the training phase. After six training sessions in which no verbal initiations occurred, Shane suddenly made verbal initiations at the rate of 2 and then 5 responses per session. Donald appeared to learn verbal initiations as soon as training was provided, however his number of verbal initiations was more variable during the training phase, ranging from 0 to 5 shares per session. Once correspondence training was introduced, the number of verbal initiations was consistent with the criterion set for both children. Shane never failed to meet the criterion number of verbal shares while Donald missed the criterion level only twice out of a total of 28 correspondence training sessions. When the second baseline phase was

Table 13

The Mean Duration of Physical Shares Across Phases

	BRENT	TRACEY
Baseline 1	0.7	0.0
Training (Phys.)	1.4	0.8
Correspondence		
Criterion = 5	3.4	0.0
= 8	2.2	1.4
= 11	2.8	2.1
= 15	2.4	2.1
= 18	2.1	2.4
= 12	2.4	1.0
= 20	1.9	1.6
Baseline 2	2.5	1.5
Training (Verb.)	1.9	1.2
Correspondence		
Criterion = 7	0.0	0.7
= 10	1.5	1.1
= 14	0.0	0.0
= 20	2.5	1.1
= 12	2.2	2.0
= 20	8.4	1.4

Table 13

The Mean Duration of Physical Shares Across Phases

	SHANE	BRAD
Baseline 1	1.1	1.0
Training (Verb.)	2.7	0.5
Correspondence		
Criterion = 1	0.0	0.0
= 3	1.8	0.0
= 5	1.7	0.4
= 7	4.1	4.8
= 9	0.8	0.8
= 13	5.4	9.9
= 11	1.6	1.7
= 15	1.2	0.0
Baseline 2	1.7	1.4
Training (Phys.)	2.6	2.5
Correspondence		
Criterion = 5	3.6	6.4
= 8	2.1	1.8
= 12	1.6	1.6
= 16	2.8	2.1
= 20	3.0	1.0
= 14	2.7	2.4
= 22	2.5	2.1

Table 13

The Mean Duration of Physical Shares Across Phases

	CORRINA	DEBBIE
Baseline 1	0.0	0.0
Training (Phys.)	3.8	3.1
Correspondence		
Criterion = 5	3.4	1.8
= 8	3.4	3.1
= 12	3.8	3.1
= 17	3.1	3.1
= 10	3.7	3.7
= 16	3.1	3.0
= 22	3.9	2.6
Baseline 2	0.0	0.0
Training (Verb.)	2.0	2.2
Correspondence		
Criterion = 7	1.6	1.5
= 10	2.7	2.2
= 15	1.2	1.5
= 20	1.5	2.1
= 12	2.5	2.4
= 20	2.1	2.7

Table 13

The Mean Duration of Physical Shares Across Phases

	DONALD	TONI
Baseline 1	0.0	0.5
Training (Verb.)	5.4	3.2
Correspondence		
Criterion = 3	6.5	2.7
= 5	1.6	2.6
= 7	2.9	2.9
= 9	2.2	3.0
= 11	9.4	3.5
= 9	5.0	3.8
= 12	0.3	0.0
= 15	4.3	4.3
Baseline 2	1.1	1.5
Training (Phys.)	1.1	2.0
Correspondence		
Criterion = 5	1.8	2.9
= 8	0.9	2.0
= 12	2.5	3.2
= 17	2.0	3.2
= 10	3.2	1.6
= 20	3.3	3.4

introduced, Donald and Shane continued to initiate verbal shares at high levels. However, after four or five baseline sessions, both subjects reduced their number of shares to near zero levels. The number of verbal initiations displayed by Donald and Shane remained close to zero for the final training and correspondence training phases, although both subjects engaged in several verbal initiations towards the end of the experiment.

The partners of Donald and Shane namely, Toni and Brad, showed fewer socially significant changes in their number of verbal initiations throughout the experiment. For Toni, the highest number of verbal shares for any session was 6, occurring in phase 3, when correspondence training was provided to her partner Donald for verbal initiations. In those phases where training was not provided to Toni for verbal sharing (i.e., 1,4,5, and 6), the number of verbal initiations was consistently zero. Brad's number of verbal initiations was zero during baseline 1, and near-zero during the training phase. However, in phase 3, when correspondence training was being provided to his partner, Brad's number of verbal shares ranged from 0 to 7. In Baseline 2, the number of verbal shares peaked at 15, before decreasing to low but variable levels. In the final two phases, Brad's number of shares was near-zero again.

Brent and Corrina showed near-zero and zero rates of verbal sharing respectively during the first four phases of the experiment. It was only when training for verbal initiations was implemented that both children significantly increased their levels of verbal sharing. Brent showed an immediate increase in the number of verbal initiations to between 5 and 8 when training for verbal initiations was

implemented. Corrina's number of verbal initiations fluctuated between 0 and 5 during phase 5, the training for verbal initiations phase. With the introduction of correspondence training in the final phase of the experiment, both Brent and Corrina matched their number of verbal initiations closely to the criterion levels. No data points fell below the criterion level at any stage.

The partners of Brent and Corrina, namely Tracey and Debbie, displayed rates of verbal initiations which remained extremely close to zero throughout phases 1, 2, 3, and 4 of the experiment. However, with the introduction of training for verbal initiations in phase 5, Tracey increased her number of initiations to a maximum of 5. In the final phase, Tracey showed a dramatic but variable increase in the number of verbal initiations, peaking at 22 verbal shares in one session. Debbie's number of verbal initiations remained close to zero throughout all 6 phases of the experiment.

Verbal Sharing - agreements

For seven out of eight children, the number of verbal agreements remained close to zero throughout the experiment. The eighth child, Toni, showed a slight increase in this behaviour following training.

Share refusal

For all children except Brad, the mean number of share refusals remained close to zero throughout the experiment. Brad's share refusals varied, reaching a maximum of 6 in the final phase when the criterion level for physical sharing was 12.

Inappropriate behaviour

The mean rates of inappropriate behaviour remained close to zero for four subjects, Tracey, Corrina, Debbie, and Shane. It was slightly higher and variable for the other four, Brent, Brad, Donald, and Toni.

Positive Social

All children showed some increases in their positive social behaviour from baseline to training phases. All children engaged in mean baseline rates of below 1.0 positive social responses per session. Brent showed a general increase in this behaviour during correspondence and the second training phases, with a mean of 12.7 responses occurring when the criterion was set at 10 verbal shares per session. During baseline and training phases, Tracey's mean number of positive social responses never rose above 0.4 but reached a mean of 9.3 during correspondence training (criterion = 10 verbal shares). Corrina made no positive social responses during Baseline 1, Training of physical sharing, and the first four criterion changes. This behaviour also occurred at a very low rate during Baseline 2 and Training of verbal shares. However for the last part of correspondence training for physical sharing and the whole of the second correspondence training phase her positive social behaviour increased, reaching a maximum of 4.7. Debbie's mean number of positive social responses was zero in all but one phase, until correspondence training was introduced for her partner, Corrina, in the final phase of the experiment. The exception occurred during the first correspondence training phase, when Debbie's mean number of

positive social responses was 2.3. In the final phase, Debbie reached a maximum of 4.0 positive social responses. Shane showed no positive social behaviour during Baseline 1 and the first training phase, however this behaviour increased slightly during some correspondence training phases. The maximum number of positive social responses for Shane was 5.0 and this occurred in the first half of the experiment when correspondence training was provided for verbal sharing (criterion = 3). Brad displayed near-zero levels of positive social behaviour in all phases except three. The exceptions all occurred during correspondence training phases when he averaged between 1.0 and 3.3 positive social responses per session. Donald's positive social behaviour occurred at low levels throughout the experiment, although at the final criterion level of correspondence training for physical sharing, he reached a mean of 3.7 responses per session. Toni displayed low levels of positive social behaviour with a mean of 2.3 responses in the correspondence training for verbal sharing phase (criterion = 11).

Independent behaviour

There was little change in the mean occurrence of independent behaviour throughout the experiment. The lowest mean number of responses for any child was 54.2 per session. All children engaged in 60 independent responses out of 60 intervals during Baseline 1. Once training and correspondence training were introduced, the mean number of independent responses decreased for all children. Overall, there appeared to be greater reductions in independent behaviour when correspondence training for physical sharing was provided. The lack

of significant change in independent responses may be due to the fact that stringent criteria were set regarding these responses. Independent behaviour was always scored unless the duration of physical sharing was 5 seconds or longer in a 10-second interval. This criterion resulted in few occasions in which independent behaviour was not scored since physical sharing rarely occurred during the majority of phases and then it rarely lasted more than 5 seconds per response.

Appropriate Verbalizations

Table 14 displays the mean number of verbalizations for each child across all phases of the experiment. All children except Toni showed significant increases from Baseline 1 to Correspondence training phases. Brent averaged 6.0 appropriate verbalizations during Baseline 1 and increasing threefold when training for physical sharing was implemented. In all subsequent phases, Brent's mean number of appropriate verbalizations ranged from 23.0 to 42.0. Tracey also showed a dramatic increase following the introduction of correspondence training phases. Tracey's baseline rate of 3.0 rose to a maximum of 39.0 when correspondence training for verbal sharing was provided to her partner, Brent. Following the first training phase, Tracey's mean number of appropriate verbalizations never fell below 17.7. Corrina's mean number of appropriate verbalizations remained below 0.8 during Baseline 1, Training for physical sharing, Correspondence training for physical sharing, and Baseline 2. Once training was implemented for verbal sharing, the mean number of appropriate verbalizations increased to 7.8. The introduction of

correspondence training for verbal sharing resulted in further increases in this behaviour. During this final phase, Corrina's mean number of appropriate verbalizations ranged from 18.7 to 40.7. Debbie's appropriate verbalization ranged from 0.0 to 6.0 during the first four phases of the experiment and increased when training for verbal sharing was implemented to a mean of 13.7. During correspondence training for verbal shares it reached a mean of of 28.3 (criterion = 7).

Insert Table 14 about here

For those children who received training for verbal sharing first (Shane, Brad, Donald, and Toni) the effects were not quite so dramatic. Shane had a baseline mean of 15.6 appropriate verbalizations. This decreased to 10.5 when training for verbal sharing was implemented but increased in all subsequent phases. In all phases following the first training phase, Shane's mean number of appropriate verbalizations ranged from 20.2 to 48.7. Shane's partner, Brad, did not show a significant increase in appropriate verbalizations once training for verbal sharing was introduced. However, in the final two phases of the experiment, this behaviour showed a significant increase when compared to the Baseline 1 mean of 26.6. The introduction of training and correspondence training for physical sharing increased Brad's appropriate verbalizations to a mean of 49.0. Donald displayed a mean number of 25.3 appropriate verbalizations in Baseline 1 and a similar level when training for verbal sharing was implemented. During correspondence training,

Table 14

Mean Number of Verbalizations Across Phases

BRENT

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	6.0	0.8
Training (Phys.)	17.3	0.8
Correspondence		
Criterion = 5	23.0	3.7
= 8	26.3	1.5
= 11	36.7	0.3
= 15	23.6	0.6
= 18	32.0	0.3
= 12	28.3	0.0
= 20	34.0	1.7
Baseline 2	23.0	1.2
Training (Verb.)	39.3	2.3
Correspondence		
Criterion = 7	37.5	2.5
= 10	33.7	0.0
= 14	37.0	0.0
= 20	42.0	0.0
= 12	28.7	0.0
= 20	32.3	0.3

Table 14

Mean Number of Verbalizations Across Phases

TRACEY

	Behaviours	
Phases	Appropriate	Inappropriate
Baseline 1	3.0	0.0
Training (Phys.)	7.0	0.0
Correspondence		
Criterion = 5	37.3	0.7
= 8	25.5	0.3
= 11	17.7	0.3
= 15	18.1	0.0
= 18	21.5	0.2
= 12	22.3	0.0
= 20	28.3	0.3
Baseline 2	26.5	0.3
Training (Verb.)	29.3	0.0
Correspondence		
Criterion = 7	31.0	1.7
= 10	31.7	0.0
= 14	34.0	1.0
= 20	39.0	0.0
= 12	31.0	0.7
= 20	30.0	0.3

Table 14

Mean Number of Verbalizations Across Phases

CORRINA

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	0.0	0.0
Training (Phys.)	0.0	0.0
Correspondence		
Criterion = 5	0.0	0.0
= 8	0.0	0.0
= 12	0.0	0.0
= 17	0.0	0.0
= 10	0.3	0.0
= 16	0.0	0.0
= 22	0.7	0.0
Baseline 2	0.0	0.0
Training (Verb.)	7.8	0.0
Correspondence		
Criterion = 7	19.0	0.0
= 10	18.7	0.0
= 15	19.0	0.0
= 20	35.0	0.0
= 12	24.3	0.0
= 20	40.7	0.0

Table 14

Mean Number of Verbalizations Across Phases

DEBBIE

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	3.3	0.0
Training (Phys.)	1.4	0.0
Correspondence		
Criterion = 5	1.6	0.0
= 8	4.0	0.0
= 12	0.0	0.0
= 17	3.3	0.0
= 10	4.0	0.0
= 16	1.0	0.0
= 22	4.3	0.0
Baseline 2	6.0	0.0
Training (Verb.)	13.7	0.0
Correspondence		
Criterion = 7	28.3	0.0
= 10	9.0	0.0
= 15	1.7	0.0
= 20	11.3	0.0
= 12	15.0	0.0
= 20	12.3	0.0

Table 14

Mean Number of Verbalizations Across Phases

SHANE

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	15.6	0.7
Training (Verb.)	10.5	0.0
Correspondence		
Criterion = 1	41.3	0.0
= 3	32.3	0.3
= 5	45.7	1.0
= 7	35.3	0.7
= 9	33.7	0.7
= 13	48.7	0.0
= 11	42.7	1.3
= 15	38.0	1.0
Baseline 2	20.2	0.2
Training (Phys.)	33.0	0.6
Correspondence		
Criterion = 5	36.7	0.0
= 8	32.0	1.0
= 12	35.7	1.0
= 16	29.3	0.3
= 20	21.7	0.0
= 14	30.3	0.3
= 22	24.7	0.0

Table 14

Mean Number of Verbalizations Across Phases

	BRAD	
	Behaviours	
Phases	Appropriate	Inappropriate
Baseline 1	26.6	0.5
Training (Verb.)	21.1	0.0
Correspondence		
Criterion = 1	32.0	0.0
= 3	25.0	1.3
= 5	33.0	0.3
= 7	34.0	0.7
= 9	33.3	1.7
= 13	29.7	0.7
= 11	24.7	1.0
= 15	36.3	0.3
Baseline 2	34.5	0.1
Training (Phys.)	41.2	4.4
Correspondence		
Criterion = 5	43.0	2.0
= 8	49.0	4.3
= 12	43.3	9.0
= 16	40.3	5.3
= 20	43.0	4.3
= 14	42.0	6.3
= 22	44.7	1.0

Table 14

Mean Number of Verbalizations Across Phases

DONALD

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	25.3	0.8
Training (Verb.)	22.5	1.0
Correspondence		
Criterion = 3	38.7	0.0
= 5	41.5	1.2
= 7	36.7	0.7
= 9	41.0	0.0
= 11	30.5	0.5
= 9	35.3	1.0
= 12	34.7	0.3
= 15	29.7	0.0
Baseline 2	26.4	0.4
Training (Phys.)	24.8	0.0
Correspondence		
Criterion = 5	27.0	0.0
= 8	35.0	0.0
= 12	37.0	0.3
= 17	42.0	3.0
= 10	47.3	1.3
= 20	50.0	0.7

Table 14

Mean Number of Verbalizations Across Phases

TONI

Phases	Behaviours	
	Appropriate	Inappropriate
Baseline 1	32.6	0.3
Training (Verb.)	24.2	1.1
Correspondence		
Criterion = 3	33.0	0.0
= 5	29.5	0.7
= 7	29.0	0.7
= 9	27.3	3.3
= 11	28.5	1.3
= 9	32.0	0.7
= 12	34.3	1.3
= 15	40.7	1.7
Baseline	18.3	0.1
Training (Phys.)	19.5	0.0
Correspondence		
Criterion = 5	17.7	0.3
= 8	21.7	0.0
= 12	28.0	0.0
= 17	29.7	2.3
= 10	32.3	0.3
= 20	34.3	0.3

Donald's mean number of appropriate verbalizations increased to between 29.7 and 41.5 responses per session. With the introduction of Baseline 2 and training for physical sharing, this decreased to approximately 25 appropriate verbalizations. However, the implementation of the final correspondence phase resulted in an overall increase in the mean number of verbalizations (range: 27.0 - 50.0). While Toni's mean number of appropriate verbalizations ranged from 17.7 to 40.7 throughout the experiment, there was no significant increase or decrease in this behaviour as a result of training. The only exception was a noticeable decrease in the mean number of appropriate verbalizations during Baseline 2, training for physical sharing, and the first criterion level of correspondence training. During these phases, appropriate verbalizations averaged between 17.7 and 19.5.

Inappropriate Verbalizations

Inappropriate verbalizations occurred at very low levels for all subjects throughout the experiment. Overall, there was no change in the behaviour of three children (Corrina, Debbie, Shane), slight increases as a result of correspondence training for four children (Brent, Tracey, Donald, Toni), and a significant training-related increase in one child's behaviour (Brad).

Generalization

Table 15 displays the mean number of all behaviours during generalization sessions. Overall, the generalization data indicate that sharing and positive collateral behaviours were displayed at levels similar to, or higher than, those displayed in the first

setting. All three types of sharing showed increases in both training and generalization settings once correspondence training was implemented. When correspondence training was not provided, the number of sharing and positive collateral behaviours showed concurrent decreases in both settings. With some children (e.g., Corrina - verbal initiations, Donald - physical sharing and verbal initiations, Shane - physical sharing) there was a substantial delay before sharing increased in the generalization setting following the implementation of correspondence training. Five of the eight children who participated in the experiment did not share in the second setting during Baseline 1. The other three children (Donald, Shane, Brad) averaged a mean of 1.5 shares during this phase.

Insert Table 15 about here

With the introduction of correspondence training for physical sharing, this behaviour averaged between 2.5 and 21.0 for all correspondence-trained children during generalization sessions. The mean number of verbal initiations also increased significantly when correspondence training was provided in the training setting. The third category of sharing, verbal agreements, did not show a significant increase in the generalization setting. Verbal agreements reached a mean of 2.5 across all children and generalization sessions. As in the first setting, share refusal occurred at low rates throughout the experiment with a mean of 2.5 occurring once in the second setting. Inappropriate behaviour also occurred at low levels during generalization probes, however, for three children, it reached

Table 15

Generalization Probes: Mean Number of Responses Across Phases

BRENT

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	1.5	60.0	9.0	1.0
Training	15.0	0.5	0.0	0.0	0.5	0.5	60.0	23.5	0.0
Corr.= 5	11.5	1.0	0.0	0.0	6.5	0.5	59.5	16.0	2.5
= 8	15.0	1.0	0.0	0.5	2.5	2.5	59.0	34.5	1.0
= 11	----	----	----	----	----	----	----	----	----
= 15	12.0	1.0	0.0	0.5	5.5	1.0	60.0	20.5	4.5
= 18	----	----	----	----	----	----	----	----	----
= 12	20.0	0.0	0.0	0.0	3.0	9.0	58.5	39.5	0.5
= 20	21.0	0.5	0.0	0.0	0.0	11.0	58.5	40.5	0.0
Baseline	0.0	0.0	0.0	0.5	12.0	1.0	60.0	30.5	0.5
Training	2.0	20.5	0.0	0.0	3.0	3.5	60.0	31.5	1.0
Corr.= 7	----	----	----	----	----	----	----	----	----
= 10	1.0	10.0	0.0	0.5	1.0	1.5	60.0	29.5	0.0
= 14	----	----	----	----	----	----	----	----	----
= 20	0.5	22.5	0.0	0.0	0.0	3.0	60.0	35.0	0.0
= 12	----	----	----	----	----	----	----	----	----
= 20	0.0	20.5	0.0	0.0	1.0	4.0	60.0	37.5	0.5

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

TRACEY

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	2.0	0.0
Training	0.0	0.0	0.0	0.0	0.0	0.0	60.0	9.5	0.0
Corr.= 5	0.0	0.0	0.0	0.0	0.0	1.5	60.0	7.0	0.0
= 8	7.5	0.0	0.0	1.0	0.0	2.0	59.5	8.5	0.0
= 11	----								
= 15	7.5	0.0	0.0	0.0	0.5	2.0	60.0	16.5	0.0
= 18	----								
= 12	12.0	0.0	0.0	0.0	0.0	5.0	60.0	23.0	0.0
= 20	22.5	0.0	0.0	0.0	0.0	1.0	60.0	30.5	0.0
Baseline	2.5	0.0	0.0	0.5	4.5	0.0	60.0	24.5	0.0
Training	10.5	0.5	2.5	0.0	0.0	2.0	60.0	30.5	0.0
Corr.= 7	----								
= 10	3.5	0.0	0.0	0.0	0.5	0.5	60.0	24.0	0.0
= 14	----								
= 20	0.0	25.0	0.0	0.0	0.0	0.0	60.0	51.0	0.0
= 12	----								
= 20	0.0	22.5	0.0	0.0	0.0	3.0	60.0	32.5	0.5

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

CORRINA

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0
Training	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0
Corr.= 5	----								
= 8	20.0	0.0	0.0	0.0	0.0	0.0	59.0	0.0	0.0
= 12	----								
= 17	20.5	0.0	0.0	0.0	0.0	0.5	57.0	0.0	0.0
= 10	----								
= 16	20.0	0.0	0.0	0.0	0.0	0.0	58.0	0.0	0.0
= 22	----								
Baseline	0.0	0.0	0.0	0.0	0.0	2.5	60.0	0.0	0.0
Training	1.0	0.0	0.0	0.0	0.0	0.0	59.5	0.5	0.0
Corr.= 7	----								
= 10	0.0	0.0	0.0	0.0	0.0	1.0	60.0	2.0	0.0
= 15	----								
= 20	0.5	20.0	0.0	0.0	0.0	8.0	60.0	44.0	0.0
= 12	----								
= 20	0.0	20.0	0.0	0.0	0.0	2.0	60.0	38.5	0.0

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

DEBBIE

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0
Training	0.0	0.0	0.0	0.0	0.0	0.0	60.0	3.0	0.0
Corr.= 5	----								
= 8	12.0	0.0	0.0	1.5	0.0	0.0	59.5	3.0	0.0
= 12	----								
= 17	14.0	0.0	0.0	2.0	0.0	0.0	57.5	1.5	0.0
= 10	----								
= 16	6.5	0.0	0.0	0.0	0.0	0.0	60.0	8.0	0.0
= 22	----								
Baseline	0.5	0.0	0.0	0.0	0.0	5.5	60.0	3.0	0.0
Training	1.0	0.0	0.0	0.0	0.0	0.0	59.5	5.0	0.0
Corr.= 7	----								
= 10	0.0	0.0	0.0	0.0	0.0	0.5	60.0	12.5	0.0
= 15	----								
= 20	1.5	0.5	0.0	0.5	0.0	7.0	60.0	29.0	0.0
= 12	----								
= 20	0.0	0.0	0.0	0.0	0.0	0.5	60.0	16.0	0.0

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

SHANE

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Soc.	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.5	0.0	0.0	1.0	2.0	0.0	60.0	11.0	0.0
Training	1.0	4.5	0.0	0.5	0.0	0.0	60.0	29.0	0.0
Corr.= 1	----								
= 3	----								
= 5	0.5	7.0	0.0	1.0	0.0	2.5	60.0	27.0	1.0
= 7	----								
= 9	0.0	20.0	0.0	0.0	0.0	4.5	60.0	35.5	0.5
= 13	----								
= 11	----								
= 15	3.5	20.0	0.0	0.0	0.0	0.0	57.5	33.0	0.0
Baseline	0.5	1.0	0.0	0.0	0.0	0.5	60.0	33.5	0.0
Training	0.5	0.0	0.0	0.0	0.0	0.0	60.0	29.0	0.0
Corr.= 5	----								
= 8	2.5	0.0	0.0	0.0	0.0	0.0	60.0	17.0	0.0
= 12	----								
= 16	9.0	1.0	0.0	0.0	0.0	0.0	57.5	20.5	0.0
= 20	----								
= 14	14.0	0.5	0.0	0.0	0.0	1.0	58.5	27.0	0.0
= 22	----								

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

BRAD

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Soc.	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	1.5	0.0	0.0	0.0	6.0	1.0	60.0	19.0	1.0
Training	1.0	0.5	0.0	1.0	0.5	0.0	60.0	18.0	0.0
Corr.= 1	----								
= 3	----								
= 5	0.0	1.5	0.0	0.5	0.5	0.0	60.0	16.0	0.0
= 7	----								
= 9	0.0	8.0	0.0	0.5	0.5	0.5	60.0	37.5	1.0
= 13	----								
= 11	----								
= 15	2.5	11.5	0.0	0.0	0.0	0.0	59.0	39.0	0.0
Baseline	0.5	0.0	0.0	0.0	2.5	0.5	60.0	33.5	2.5
Training	0.0	0.0	0.0	0.0	9.0	0.0	60.0	23.0	0.0
Corr.= 5	----								
= 8	0.5	0.0	0.0	0.5	0.5	0.0	60.0	41.0	1.0
= 12	----								
= 16	0.0	0.0	0.0	2.5	13.0	0.5	60.0	50.5	2.0
= 20	----								
= 14	1.0	0.0	0.0	0.5	2.5	1.5	59.5	50.0	3.0
= 22	----								

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

DONALD

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.5	0.0	0.5	1.0	0.0	60.0	14.0	0.0
Training	0.0	0.0	0.0	0.0	0.0	0.0	60.0	14.5	1.0
Corr.= 3	----								
= 5	0.5	0.0	0.0	0.0	2.0	0.5	60.0	36.0	0.0
= 7	----								
= 9	1.5	9.0	0.0	0.0	1.0	2.5	60.0	37.5	0.0
= 11	----								
= 9	----								
= 12	0.0	10.0	0.0	0.0	0.0	0.0	60.0	27.0	2.5
= 15	0.0	20.0	0.5	1.0	0.0	0.0	60.0	27.0	1.0
Baseline	0.0	0.0	0.0	1.0	28.5	0.0	60.0	22.5	1.5
Training	0.5	0.0	0.0	0.0	1.0	0.0	59.5	19.5	0.0
Corr.= 5	----								
= 8	10.0	0.5	0.0	0.0	0.0	1.0	58.5	43.5	0.0
= 12	----								
= 17	14.5	0.0	0.0	0.0	1.5	1.5	58.0	36.0	0.5
= 10	----								
= 20	20.0	1.0	0.0	0.0	0.0	1.0	53.0	44.0	0.5

Key: ---- = Generalization Probes not taken for that phase

Table 15

Generalization Probes: Mean Number of Responses Across Phases

TONI

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	13.0	0.0
Training	0.0	0.0	0.0	0.0	0.5	0.0	60.0	13.0	1.5
Corr.= 3	----								
= 5	1.0	0.0	0.0	0.5	0.5	0.0	60.0	36.0	0.0
= 7	----								
= 9	1.5	0.0	0.5	0.5	1.0	0.0	58.5	34.0	0.5
= 11	----								
= 9	----								
= 12	0.0	0.0	0.5	0.0	1.0	0.5	60.0	18.5	1.0
= 15	0.0	0.0	2.0	0.5	1.0	0.0	60.0	17.5	3.0
Baseline	0.0	0.0	0.0	0.0	13.5	0.0	60.0	15.0	0.0
Training	0.5	0.0	0.0	0.0	3.0	0.0	59.5	10.0	0.0
Corr.= 5	----								
= 8	0.0	0.0	0.5	0.0	4.0	0.5	60.0	27.5	0.0
= 12	----								
= 17	0.5	0.5	0.0	0.5	1.5	0.5	60.0	23.0	1.0
= 10	----								
= 20	0.0	0.0	0.0	0.0	0.0	0.0	60.0	37.0	0.5

Key: ---- = Generalization Probes not taken for that phase

the highest level during the second baseline phase. Positive social behaviour showed changes which paralleled those shown in the first setting. In general, this behaviour showed significant increases following the introduction of the training phases. As in the first setting, independent behaviour remained at high levels throughout the experiment, decreasing slightly with the introduction of training for physical sharing. The mean number of appropriate verbalizations showed a substantial increase in the second setting as a result of various training procedures. Finally, the mean number of inappropriate verbalizations remained below 4.6 throughout all generalization probes, the highest rate occurring during a correspondence training phase.

Assessment of the Independent Variable

The reliability of the independent variable was assessed throughout the experiment. For each child, 25 prior-to-play sessions and 25 after-play sessions out of a possible mean total of 62 training sessions were assessed. These sessions were randomly selected with all training phases being equally represented. Prior-to-play sessions were subdivided into nine measures, with an additional three measures applicable when correspondence training was implemented. After-play sessions involved a total of eight measures, of which only two were possible for each session. Tables 16 and 17 illustrate the format of the data sheets used to assess the consistency of the independent variable.

Insert Tables 16 and 17 about here

Trainer 1 was responsible for the training of Brent and Debbie. For Brent there was 100% accuracy for all 12 measures assessed in the prior-to-play sessions and for the 2 measures assessed during after-play sessions. For Debbie, 24 out of 25 prior-to-play sessions were 100% accurate. In one session, Trainer 1 deviated from the normal training procedure by substituting the wrong child's name in one of the examples. Debbie's after-play sessions were all 100% correct. Trainer 2 carried out the training procedures for Corrina and Tracey. Of the 25 sessions assessed for Corrina, 20 were 100% correct. Of the remaining five sessions, four involved the omission of the sentence, "Remember to move a bead over each time you share the toys with --". In the other session, Trainer 2 failed to provide the second example with the counter, namely, "Say you just went over to -- and helped him with his toys, what do you do next?" Two after-play sessions involved errors. These both occurred when the trainer reinforced Corrina for sharing x times without stressing the correspondence between the child's verbal and nonverbal behaviour. There were fewer errors during Tracey's training sessions. Of the 25 prior-to-play sessions and 25 after-play sessions, one error occurred on one measure. In this session, the trainer failed to provide one of the examples relating to the use of the counter. Trainer 3 was responsible for the training of Shane and Donald. In 1 out of 25 sessions for Shane, Trainer 3 omitted the reminder, "Remember to move a bead over each time you share the toys with --". All of the after-play sessions were

Table 16

Prior to Play Sessions for Physical Sharing

Session:	1	2	3	4	5	6	7	8	9	10
Date:										
Child's Name:										
Do you know how to share with --? O.K., how?										
Eg.1. You can share with -- by going over and helping him with his toys.										
Child repeats Eg.1.										
Eg.2. You can share with -- by giving him some of your toys.										
Child repeats Eg.2.										
This is a counter. Every time you share with --, move one bead over. Now you try.										
Say you just tried to share with --, what do you do next?										
Say you just went over to -- and helped him with his toys. What do you do next?										
Remember to move a bead over each time you try to share the toys with --.										
How about sharing with -- today? Can you do that?										
How about sharing x times?										
So how many times are you going to share?										

Table 17

After Play Sessions for Physical Sharing

Session:	1	2	3	4	5	6	7	8	9	10
Date:										
Child's Name:										
I see you shared x times today.										
You're a very good boy/girl.										
I see you didn't share today										
See if you can try harder tomorrow.										
You said you were going to share x times, and you did.										
You're a very good boy/girl										
You said you were going to share x times, but you didn't really, did you?										
See if you can try harder tomorrow.										

100% correct. On two of Donald's sessions, the trainer omitted the reminder, "Remember to move a bead over each time you share the toys with --". On one other prior-to-play session, the trainer omitted the final question, "So how many times are you going to ask Toni to share?" All of the after-play sessions were error-free. Trainer 4 was responsible for Toni and Brad. All sessions for both children were 100% accurate. The only exception occurred during an after-play session for Toni, when the trainer praised her for sharing but also added the comment "See if you can try harder tomorrow".

DISCUSSION

Experiment 6 was designed to investigate the effects of a say-do correspondence training procedure upon sharing and collateral behaviours. The results indicated that this procedure was highly effective in the facilitation of sharing. For the children who received correspondence training (Brent, Corrina, Shane, and Donald), physical and verbal sharing increased to rates consistent with the criterion levels imposed. Other forms of sharing (e.g., verbal initiations, verbal agreements) generally remained at low levels unless specifically trained. However, Tracey, Corrina, and Debbie exhibited low levels of physical sharing when verbal sharing was trained during phase 6. Similarly, Shane made several verbal initiations during phase 6 when he was receiving correspondence training for physical sharing.

Ballard (1983) noted that correspondence training would seem most feasible where the targeted response is either part of the child's

repertoire or is readily performed following identification and perhaps modeling of the response. For example, Rogers-Warren and Baer (1976) used correspondence training to increase sharing and praising behaviours. Sharing was already exhibited at low levels during baseline sessions. In addition, modeling of the target behaviours and appropriate reporting behaviours was provided. However, in the present experiment, 18 out of a possible 24 sharing behaviours did not occur at all during the initial baseline phase. Further, there was no modeling of target or reporting behaviours. Given these factors, it is surprising that most children increased their levels of sharing when correspondence training was introduced. However, it may indicate the strength of the procedure.

Whitman et al. (1984) pointed out that correspondence training requires a certain level of receptive and linguistic ability on the part of the child. In addition, the child receiving say-do training must be able to comprehend questions concerning his or her intention to behave in a certain fashion during training. Previous investigations of correspondence training have generally involved children with normal intelligence (e.g., Ballard & Jenner, 1981; Israel & Brown, 1977; Israel & O'Leary, 1973; Osnes et al., 1986; Risley & Hart, 1968; Rogers-Warren & Baer, 1976; Rogers-Warren et al., 1977; Rumsey & Ballard, 1985). The present experiment extends the research findings on correspondence training to mentally retarded children.

An interesting observation was that two of the trained participants repeated aloud the instructions they had received during training sessions (i.e., Shane, Brent). These boys used the training

instructions to guide their own behaviour. For example, Brent would say to himself "Now, you got to go over to Tracey and help her with her toys" before initiating a physical share. These self-instructions occurred most frequently during training and correspondence training for physical sharing when he appeared to be having difficulty remembering what was required of him. The self-instructions disappeared in the later stages of correspondence training. Meichenbaum (1975) noted that children talked to themselves while completing academic tasks. Based on this observation, Meichenbaum developed self-instructional training programs.

Another interesting finding was that two of the trained children failed to notice the change in the reinforcement contingency during Baseline 2. Both Shane and Donald continued to share at high rates during the initial sessions of Baseline 2. Shane was observed to make numerous verbal initiations, laughing to himself as he moved each bead over. Donald also initiated verbal shares and moved his beads over. At the end of each session, he took his counting device to his trainer and pointed to his beads with the words, "Look, Louise, I've moved all my beads over today". Donald acted as if his trainer had merely forgotten to check his beads and provide social reinforcement. This participant's behaviour is logical, given that he may have had similar experiences with caregivers failing to reinforce particular behaviours. This finding also suggests that for some of the participants at least, the potency of social reinforcement was high given that all children continued to receive their sweet or sticker for participating in the play session. After a total of four sessions for each child, the experimenter informed them that they would not

receive hugs and praise for sharing. This explicit information regarding the nature of reinforcement appeared to produce instantaneous decreases in the rate of sharing for both boys. However, the changes in behaviour may have been due to other variables (e.g., the participants being slow in coming under the control of the contingencies).

One question which arises from the present experiment is why some of the untrained children never learned to share. The obvious answer is that sharing never developed because the children concerned did not receive correspondence training. The veracity of this explanation is questionable since the untrained children were never given the opportunity to benefit from correspondence training. Another possibility is that these children differed from the trained children in terms of cognitive ability and behaviour problems. For example, one untrained child (Toni) was autistic. She took no interest in the training program and it was diificult for the trainers to get her to repeat the examples of sharing. For the duration of the experiment, Toni displayed extremely low rates of verbal and physical sharing in play sessions. Rogers-Warren & Baer (1976) found that younger children took longer to learn how to report sharing and to engage in the behaviour. In the present experiment, the brighter child in each pair was selected for correspondence training, since the experimenter wanted to maximize the chances that the children could benefit from the procedure. For this reason, however, it cannot be said that it was due to the absence of correspondence training that the untrained children never learned to share.

Several of the untrained children did learn to share at socially

significant levels. Debbie engaged in physical sharing while her partner, Corrina, received correspondence training for this behaviour. However, Debbie failed to initiate verbal shares. Brad began verbal sharing towards the end of the phase when Shane was receiving correspondence training for this behaviour. Brad never exhibited high rates of physical sharing. Tracey was the only untrained child who engaged in high levels of both physical and verbal sharing during the respective correspondence training phases. In spite of her hyperactive behaviour Tracey learnt the correct phrases for verbal sharing and initiated physical shares at variable rates which occasionally exceeded the levels of her partner. One explanation for the physical sharing behaviour of untrained participants is that they passively acquired these responses through the efforts of their partners. Often the trained child would help or share with the untrained child thus enabling both of them to move a bead for physically sharing. Thus, if the untrained child did not resist the share initiations of his/her partner, s/he was duly reinforced at the end of the play session.

Another reason why sharing was exhibited by the untrained child was that, on some occasions, the untrained child appeared to model off his/her partner who was receiving correspondence training. Tracey, for example, watched Brent over a number of play sessions before she began to share herself. In addition, her physical and verbal shares were identical in form to those of Brent. This suggested that she was attending to her partner's sharing behaviour as well as learning from the instructions provided during training. Rogers-Warren and Baer (1976) also commented on the presence of "informal, unprogrammed peer

models" in their study. They suggested that these models may have influenced the rate of sharing, praising, and other appropriate behaviours since they gave instructions to peers regarding these behaviours and explained the contingencies of reinforcement. The results of the present experiment confirm the findings of Rogers-Warren and Baer and demonstrate that mentally retarded children may also serve as informal peer models.

Correspondence training represents an effective alternative to traditional operant procedures for modifying sharing behaviour. This procedure is less intrusive and does not interrupt the ongoing sharing responses and social exchanges of the children. The present results show that mentally retarded children can be taught to share using correspondence training. This finding is in contrast with that of Brodsky (1967) who found that reinforcing the verbally stated intentions of a mentally retarded girl did not produce increases in her corresponding social behaviour. Brodsky's findings did not support the idea that mentally retarded persons can benefit from the reinforcement of verbal behaviour. However, the present results are consistent with basic experimental studies which showed that although mentally retarded individuals have mediational deficiencies (cf. Brown, 1974; Jensen & Rohwer, 1965; Milgram, 1969) these deficiencies can be ameliorated. Applied research has also indicated that correspondence training is effective with mentally retarded persons who have learned social skills and appropriate classroom behaviours via this method (Ralph & Birnbrauer, 1986; Robertson, Simon, Pachman, & Drabman, 1979; Whitman et al., 1982).

Fowler and Baer (1981) pointed out that "the ability to tolerate

inconsistent schedules of reinforcement and delays in reinforcement often becomes critical for maintenance of specific behaviour changes, as well as for generally successful functioning in society". The results of the present experiment showed that sharing behaviours could be trained to occur in settings where there were no immediate reinforcers for those behaviours. The fact that mildly and moderately mentally retarded children could benefit from correspondence training is remarkable given that it is difficult to endure reinforcement delays. For this reason, correspondence training can be seen to inadvertently develop an important skill, namely the ability to tolerate delayed reinforcement. Fowler and Baer (1981) added that delayed reinforcement is not an efficient method for changing behaviour but it can be an effective procedure for maintaining it.

Correspondence training may be useful in the training of other target behaviours with mentally retarded children. Further research is needed to determine the efficacy of this procedure with a wide range of target behaviours and subject populations. To date, no research has investigated the use of this procedure with severely or profoundly mentally retarded persons. The show-do procedure in particular, deserves investigation with this subject population. Another advantage of correspondence training is that it is a relatively simple procedure, which teachers, parents, and other caregivers can use with ease. While previous researchers have advocated the use of complex, multi-component training packages (e.g., Barton & Ascione, 1979; Bryant & Budd, 1984; Rogers-Warren et al., 1977), these would seem time-consuming and impractical in the light of the present findings.

Many of the collateral behaviours showed training-related changes. Positive social behaviour increased following the implementation of correspondence training. This effect was apparent for five out of eight participants (Brent, Tracey, Corrina, Debbie, Shane) irrespective of whether they received correspondence training or not. Positive social behaviour generally accompanied sharing or occurred as a direct result of sharing. There was anecdotal evidence which indicated that when a trained child asked his/her partner to share, and the partner agreed, the former would thank or smile at the latter. On other occasions, the trained child would smile at his/her partner while sharing. It appears that for the trained children at least, generalization occurred from sharing responses to other positive social responses. Also, some of the trained children seemed to realize that acting positively towards the partner maximized the chances of sharing with that child. While this suggestion is based on anecdotal observations only, it would seem logical that some of the higher functioning children would learn that these behaviours (e.g., smiling, saying "thank you") could help them achieve their goal (of sharing, and subsequently being reinforced). One explanation for why some of the untrained children increased their rates of positive social behaviour may be that they reciprocated when the trained child acted sociably or shared with them. Tracey, for example, always said "thank you" and smiled when Brent gave her a toy. The present findings are consistent with that of Singh and Millichamp (1987) who reported that the rate of appropriate social interaction increased when profoundly mentally retarded adults were taught social play skills.

The number of appropriate verbalizations increased markedly when correspondence training was implemented for both physical and verbal sharing. The high rates of appropriate verbalizations during training and correspondence training for physical sharing may be explained by the fact that when children share the same toy or activity, they have a common topic or subject of interest to discuss. With a joint activity, there is more need to communicate or relay instructions regarding the aims and direction of the project. It is interesting to note that appropriate verbalizations were emitted most frequently during training and correspondence training for verbal sharing. One explanation for this is that once training was provided for verbal sharing, this effect generalized to other verbal responses. The fact that the children were required to speak to each other (via verbal initiations) and were given the opportunity to reply (in the form of verbal agreements) may have stimulated further conversation.

No studies could be found which assessed the effects of training sharing upon verbal interactions. However, some researchers have successfully trained language skills within the context of play (e.g., Jeffree & McConkey, 1974). Nordquist and Bradley (1973) used contingent attention to increase the frequency of cooperative play with a nonverbal isolate child. It was reported that with the introduction of contingent attention there were concurrent increases in the child's verbal behaviour. Keogh et al. (1984) reported training-related increases in verbal behaviour. The data showed that when training was implemented for social-leisure skills there were concomitant increases in the verbal interactions of severely retarded adolescents. Finally, Foxx, McMorrow, and Mennemeier (1984) found

that mildly and moderately retarded adults who were taught social/vocational skills in an institutional setting displayed increased rates of appropriate verbal interactions in the workshop setting.

Negative collateral behaviours (i.e., share refusal, inappropriate behaviour, and inappropriate verbalizations) did not show any marked trends as a result of correspondence training. Four of the participants showed low, stable levels of inappropriate behaviour (i.e., Tracey, Corrina, Debbie, Shane). One child exhibited inappropriate behaviour more often during baseline (i.e., Brent) and for two other children, there appeared to be slightly higher rates of inappropriate responding during the training phases (i.e., Brad, Toni). An interesting finding was that for one trained child (Brent) the frequency of share refusals and inappropriate responses was highest during Baseline II than in any other phase or criterion level. It appeared that for this child, it was highly frustrating to suddenly receive no social reinforcement and to have no criterion levels set. It was observed that during Baseline II, Brent constantly asked about sharing and whether he could share with Tracey. When he realized that social reinforcement was no longer provided for sharing responses, he became annoyed with the trainers for not rewarding him and began to engage in negative and disruptive behaviours. It may also be that Brent was bored when he no longer had a goal to aim for. When correspondence training was reintroduced, the number of inappropriate behaviours gradually decreased, and Brent seemed more content during the play sessions. Another trained child (Donald) became very subdued during Baseline 2. He was less enthusiastic about playing with the

play materials, and sat quietly throughout many play sessions. Donald appeared to interpret the removal of the sharing task and the social reinforcement, as a punishment for some form of misbehaviour. In fact, for many of the children, it was the removal of their responsibility (in the form of the criterions set for sharing) which perturbed them most. Only one child (Shane) bemoaned the lack of "cuddles". The other children enquired as to why the trainers weren't "doing the bead thing" anymore. It may be that the children had learned to associate privileged activities (e.g., being a class monitor, being sent on messages, holding positions of responsibility) as positively reinforcing. Sharing may have been classified as a privileged activity. Certainly, the children were always extremely keen to attend the play sessions and to participate in training activities. Correspondence training appears to have positive effects on a number of collateral behaviours. Further research is necessary to measure these effects with a range of target and collateral behaviours.

For those children who received correspondence training, generalization occurred across settings. The target behaviours and several collateral behaviours showed training-related increases in the second setting. Some of the untrained childen also showed generalization effects with verbal sharing (i.e., Tracey, Brad), physical sharing (i.e., Tracey, Debbie), and to a lesser extent with collateral behaviours. Contrary to the present findings, Rogers-Warren & Baer (1976) found that sharing but not praising generalized to a second setting. The present experiment showed that response generalization did occur despite the fact that the children were

mentally retarded. However, one reason why generalization was so pronounced in the present experiment may be that the presence of the plastic counters served as discriminative stimuli for sharing in the second setting.

Correspondence training has considerable potential for the facilitation of generalization. A number of researchers have suggested that generalization is enhanced by the indiscriminability of the reinforcement contingencies with correspondence training. In this respect, the procedure ressembles delayed reinforcement since it prevents discrimination of the settings in which the reinforcement contingencies actually operate (e.g., Schwarz & Hawkins, 1970; Stokes & Baer, 1977, p.358). Rogers-Warren and Baer (1976) suggested that more generalization might occur with the do-say procedure since a greater length of time will elapse during which verbal statements might affect the corresponding behaviour.

EXPERIMENT 7

Several studies have utilised the do-say correspondence training procedure with normal children. Risley and Hart (1968) were the first to specifically train correspondence between verbal and nonverbal behaviours. They used a do-say procedure to encourage preschool children to play with play materials. Edible reinforcement and praise were provided contingent on accurate reports. The results showed that the do-say procedure increased the use of specific play materials. Jewett and Clark (1979) taught preschoolers appropriate dinnertime conversation skills using role play, reinforcement, and do-say correspondence training. These researchers reported that correspondence training was an effective method which could be implemented in the school setting to increase behaviours in the home setting. Rogers-Warren and Baer (1976) used a do-say procedure to teach preschool children to share and praise. Reinforcement, consisting of praise and food was provided for any reports versus true reports. The latter produced higher rates of both reporting and actual behaviour. Rogers-Warren et al.(1977) used a do-say procedure to develop sharing in preschool children. They evaluated several components of correspondence training and found that the combined use of modeling, self-reporting, and reinforcement of true reports of sharing was most effective for all subjects. These researchers used praise and food (or trinkets) as reinforcement. Collectively, the do-say correspondence training studies show that it represents an effective means of increasing appropriate behaviours. However, the findings are limited to a few target behaviours and to

children of normal intelligence. In addition, correspondence between verbal reports and the target behaviour has generally been reinforced with a combination of edible and social reinforcement.

In Experiment 6, a say-do correspondence training procedure was used to teach sharing behaviour to mentally retarded children. This procedure had been found to be effective in the facilitation of both verbal and physical sharing. A number of positive effects also occurred with respect to the collateral behaviours. Experiment 7 was designed to evaluate the efficacy of do-say correspondence training on mentally retarded children, a procedure that had not been used with this population before. The correspondence training procedure employed in Experiment 7 did not involve additional training components such as modeling or training in self-reporting skills as has been used in previous studies. As in Experiment 6, generalization probes were taken and a wide range of collateral behaviours assessed.

METHOD

Four boys participated in this experiment. All participants had been classified as mildly mentally retarded according to AAMD criteria (Grossman, 1983) and attended a state-run residential school for mildly mentally retarded boys. Participation in the experiment was determined by teacher opinion of which boys displayed few sharing skills and by the availability of the boys themselves. The boys were aged between 9 and 11 years (mean = 10 years). Chris, Tari, and Marcus had histories of aggressive behaviour and noncompliance while

Derek was extremely shy and withdrawn. Table 18 provides further information concerning individual children. Motor, language, and cognitive problems were scored on a scale (from none to severe), which was compiled from teacher records and test reports. None of the boys received medication at any stage during the experiment.

Insert Table 18 about here

The experiment was conducted in a 5m x 6m TV room in the boys' residential villa. The TV room contained chairs, beanbags, and a television set. Generalization data were collected in the recreation room located in the same villa. This room measured 10m by 6m and was furnished with chairs, tables, and a pool table. A wide range of play materials was available during all play sessions. These included wooden trucks, cars, trailers, a large wooden service station, plastic and wooden blocks, and a toolbox set. These multiple- and single-item toys were selected on account of their popularity with the participants and their durability. Multiple-item toys were included since there is evidence that these toys are more likely to promote sharing.

Each participant was provided with a counting device which consisted of beads threaded onto a wire loop. This device enabled the boys to count the number of times they had shared during a play session. Tape recorders were used to record the boys' verbalizations during each play session and to record all conversations between the trainers and the boys. Each observer used a stopwatch to record the duration of physical sharing throughout the play sessions. A range of

Table 18

Descriptive Information About Participants

Name	Age (yrs)	Problems			
		Behaviour	Motor	Language	Cognitive
Chris	10	Aggression, temper tantrums	None	None	None
Derek	11	Shyness, withdrawal	Mod	Severe	Mild
Tarl	11	Noncompliance, aggression, swearing	None	Mild	Mild
Marcus	9	Aggression, noncompliance, tantrums, swearing	Mod	Severe	Mild

sweets and stickers was available as a reward for participating in the play sessions.

The boys visited the TV room in pairs, once daily. If a pair could not attend a play session every weekday, extra sessions were scheduled on the remaining days. During the 10-minute play session, the boys were allowed to move freely around the TV room as long as they did not leave the room or act aggressively towards other boys or materials. If a boy attempted to leave the TV room during a play session, he was asked to return. If this request was ignored, he was led back to the play area. If a boy was severely disruptive or aggressive, he was asked to desist and if this request was ignored he was sent back to his classroom. (The boys all valued highly their participation in the experiment. Consequently, there were few severe disruptions.)

Generalization was assessed at regular intervals throughout the experiment. A minimum of two generalization probes were made per experimental phase and for every other criterion level. The same play materials were used in both the training and generalization settings.

Response Definitions

All eight behaviours observed and recorded in this experiment were identical to those used in Experiment 6. The same definitions were used. The behaviours recorded were: Physical Sharing - initiation; Physical Sharing - ongoing; Verbal Sharing - initiation; Verbal Sharing - agreement; Share Refusal; Inappropriate; Positive Social; and Independent Behaviour.

Verbal responses were derived from audiotape recordings of the

play sessions and were scored subsequently. Appropriate and inappropriate verbal responses were scored. The definitions were the same as in Experiment 6.

Data Collection and Reliability

The data collection and reliability procedures were identical to those in Experiment 6.

Experimental Design and Procedures

A changing criterion design with reversal (Hartmann & Hall, 1976) was used to assess the effects of a do-say procedure on sharing and collateral behaviours.

Phase 1. During this phase (Baseline 1), each pair of boys was brought to the TV room where they were instructed to play with the toys provided. A counter consisting of several beads on a wire loop was placed beside each boy. The observers did not react to the boys' play behaviour during observation sessions. Following play, the boys were allowed to choose a sweet or a sticker as a reward for participating. They were told: "Thanks for playing today, Tari" (subject's name). The baseline phase continued until the data were stable for three consecutive data points.

Phase 2. In this phase (Training), training for sharing was introduced. One pair (Tari and Marcus) received training for verbal sharing first and training for physical sharing during the second half of the experiment. The remaining two boys (Chris and Derek) received training for physical sharing during Phase 2 and training for verbal

sharing in the final phases of the experiment. For training details of the latter, see phases 5 and 6.

Prior to the play session, each observer took her trainee aside and showed him the counter which contained four plastic beads. The observer said to the boy: "This is a counter. Every time you ask Marcus to share, you should move one bead over to here, like this" (the observer demonstrated). "Now you try" (the boy moved a bead over). "Good. Now say you just said to Marcus - Come and play with me, what do you do next? Show me." (the boy moved a bead over). The observer then said: "Pretend you just said to Marcus - Can I play with you?, show me what you would do next." (The boy demonstrated moving a bead over). Finally, the observer said: "Now remember to move a bead over each time you ask Marcus to share the toys with you." If the boy failed to move a bead over at any stage, the observer provided the verbal prompt: "Move a bead over." Then the question was repeated. If the boy failed twice in a row, the whole procedure was repeated. All talk sessions were tape recorded in order to determine procedural reliability.

During the 10-minute play session, each observer recorded the behaviour of the boy she worked with. Play sessions were tape recorded in order to assess training effects on the boys' verbalizations. If a boy initiated a verbal share, the observer responsible for that boy would say: "Tari, move a bead over because you just asked Marcus to share." Verbal shares which were ignored or rejected by the other boy were still counted as verbal shares and the boy initiating them was permitted to move a bead over. However, if a boy attempted to move a bead over for the wrong reason, he was told:

"Tari, you can't move a bead over because you didn't ask Marcus to share."

Following the play session, both boys were allowed to choose a sweet or a sticker as a reward for participating. They were told: "Thanks for playing today, Tari" (the appropriate boy's name was substituted for "Tari"). The observer then took the boy aside and asked: "Did you move any beads over to the other side today?" If the boy answered "yes" and this reply corresponded with his actual behaviour, the observer said: "That's right! You really did move some beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered "no" and this reply corresponded with his actual behaviour, he was told: "That's right! You didn't move any beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered incorrectly, that is, his verbal behaviour did not correspond with his actual behaviour, he was told: "But you did/didn't really move some beads over, didn't/did you?"

Phase 3. During this phase (Correspondence Training), one boy from each pair received correspondence training. The remaining boys (i.e., Marcus, Derek) continued to receive training as before. The procedure for these boys was identical to that described in Phase 2. For the boys who received correspondence training, a criterion number of verbal shares was imposed. The following details are relevant to the correspondence-trained boys only.

Prior to each play session, the boy was taken aside by his observer and shown the counter. The procedure during prior-to-play sessions was identical to that of Phase 2. The boy was provided with

the two examples and reminded to move a bead over each time he asked his partner to share with him.

During the play sessions both boys were reminded to move a bead over after initiating a verbal share. Both boys received a sweet or a sticker at the end of the play session, with the words: "Thanks for playing today, Tari."

Following the play sessions the observer took the boy aside and asked: "Did you move all the beads over to the other side today?" If the boy answered "yes" and this reply corresponded with his actual behaviour, the observer said: "That's right! You really did move all the beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered "no" and this reply corresponded with his actual behaviour, the observer looked disappointed and said: "That's right. You didn't get all the beads over. See if you can try harder tomorrow." If the boy answered incorrectly, that is, his verbal behaviour did not correspond with his actual behaviour, he was told: "But you did/didn't really move all the beads over, didn't/did you? See if you can try harder tomorrow."

The initial criterion number of verbal shares was determined by the boy's performance during the training phase. If the frequency of verbal shares was consistently high during the training phase the child began with a similar number of beads for the correspondence training phase. A boy could not move to the next criterion until he had equalled the present criterion or exceeded it by no more than two points, on three consecutive sessions. The boys who did not receive correspondence training were given the same number of beads as their correpondence-trained partners at each criterion level during the

experiment.

Phase 4. During Baseline 2, all training procedures were discontinued. The boys were brought to the TV room and instructed to play with the toys provided. If they asked about sharing, they were told: "See if you can play with the toys. We're not giving pats on the back and smiles for sharing right now." A counter was placed beside each boy. Observers made no reaction to the boys' play behaviour during observation sessions. Following the play sessions, the boys received a sweet or a sticker, with the words: "Thanks for playing today, Tari". This phase continued until verbal sharing had returned to low, stable levels.

Phase 5. In this phase (Training), training for physical sharing was introduced. One pair (Chris and Derek) received training in physical sharing first while the other pair (Tari and Marcus) received training in verbal sharing first.

Prior to the play sessions, each observer took her trainee aside and showed him the counter containing four plastic beads. The observer said: "This is a counter. Every time you share with Marcus, you should move one bead over to here like this" (the observer demonstrated). "Now you try" (the boy moved a bead over). "Good. Now say you just gave Marcus some of your toys, what do you do next? Show me." (The boy moved a bead over). The observer then said: "Pretend you just went over to Marcus and helped him with his block building, show me what you would do next" (The boy moved a bead over). Finally, the observer said: "Now remember to move a bead over each time you try to share the toys with Marcus". If the boy failed to move a bead over at any stage, the observer provided the verbal

prompt: "Move a bead over". Then the question was repeated. If the boy failed twice in a row, the whole counter procedure was repeated. All talk sessions were tape recorded in order to determine the integrity of the independent variable.

During the play session, each observer recorded the behaviour of the boy she worked with. Play sessions were tape recorded to assess the effects of training on the boys' verbalizations. If a boy physically shared, the observer responsible for that boy said: "Tari, move a bead over because you just shared with Marcus." Attempts to share which were refused or ignored by the other boy were still counted as physical shares, and the boy was permitted to move a bead over. However, if a boy attempted to move a bead over for the wrong reason, he was told: "Tari, you can't move a bead over because you didn't share with Marcus."

Following the play session, both boys were allowed to choose a sweet or a sticker as a reward for participating. They were told: "Thanks for playing today, Tari." The observer then took the boy aside and asked: "Did you move any beads over to the other side today?" If the boy answered "yes" and this reply corresponded with his actual behaviour, the observer said: "That's right! You really did move some beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered "no" and this reply corresponded with his actual behaviour, he was told: "That's right! You didn't move any beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered incorrectly, that is, his verbal behaviour did not correspond with his actual behaviour, he was told: "But you did/didn't really move some beads

over, didn't/did you?"

Phase 6. Those boys who received correspondence training in phase 3 (i.e., Tari and Chris), were the ones who received it again in this phase. The remaining boys (Marcus and Derek) continued to receive training as described in phase 5 of the experiment. For the boys who received correspondence training, a criterion number of physical shares was imposed. The following details are relevant to the correspondence-trained boys only.

Prior to each play session, the boy was taken aside and shown the counter. The procedure during prior-to-play sessions was identical to that of phase 5. The boy was provided with the two examples and reminded to move a bead over each time he tried to share with his partner.

During the play sessions, both boys were reminded to move a bead over after physically sharing. Both boys received a sweet or a sticker at the end of the play session, with the words: "Thanks for playing today, Tari."

Following the play sessions, the observer took the boy aside and asked: "Did you move all the beads over to the other side today?" If the boy answered "yes" and this reply corresponded with his actual behaviour, the observer said: "That's right! You really did move all the beads over - Good boy!" (The observer smiled at the boy and patted him on the back). If the boy answered "no" and this reply corresponded with his actual behaviour, the observer looked disappointed and said: "That's right. You didn't get all the beads over. See if you can try harder tomorrow." If the boy answered incorrectly, that is, his verbal behaviour did not correspond with his

actual behaviour, he was told: "But you did/didn't really move all the beads over, didn't/did you? See if you can try harder tomorrow."

The initial criterion number of physical shares was determined by the boy's performance during the training phase. If the frequency of physical shares was consistently high during the training phase, the child began with a similar number of beads for the correspondence training phase. A boy could not move to the next criterion until he had equalled the present criterion or exceeded it by no more than two points, on three consecutive sessions. The boys who did not receive correspondence training were given the same number of beads as their correpondence-trained partners at each criterion level during the experiment.

Generalization. Generalization was assessed at regular intervals throughout the experiment. The boys remained in their usual pairs for these observations and the same play materials were used as in the training sessions. Data collection procedures were identical to those used during baseline except that they took place in a new setting. The counters were available for the boys' use throughout generalization sessions.

RESULTS

The mean percentage of interobserver agreement across the experiment ranged from 80.5 to 100% for individual behaviours. The ranges and mean reliability scores for each behaviour are presented in Table 19. The reliabilty score was occasionally rendered 0% by the formula used. This occurred when one observer recorded 59 out of 60

occurrences, and the other recorded 60 out of 60 occurrences, resulting in a nonoccurrence agreement score of 0. That is, the observers agreed zero times on nonoccurrences. This score also resulted when the same figures were recorded for nonoccurrences.

Insert Table 19 about here

Figure 6 displays the number of physical and verbal shares for the four boys individually. Shares were represented in terms of real numbers so that a more direct interpretation of each boy's adherence to the criterion could be made. (The criteria are also expressed as real numbers). The mean frequency of collateral behaviours for individual boys is presented in Table 20.

Insert Table 20 about here

The two categories of physical sharing are presented as a combined total, since the criterion number of physical shares was determined from both behaviours. That is, both initiations and ongoing shares were accepted as contributing to the boy's criterion number of physical shares during correspondence training. The boy was permitted to move a bead over for either type of sharing, since often there was no one person responsible for initiating a physical share (i.e., both boys would start playing together). Also, it would have been difficult for the children to discriminate between initiations and ongoing shares in order to move the beads. This problem would have necessitated a great number of interruptions and judgements from the

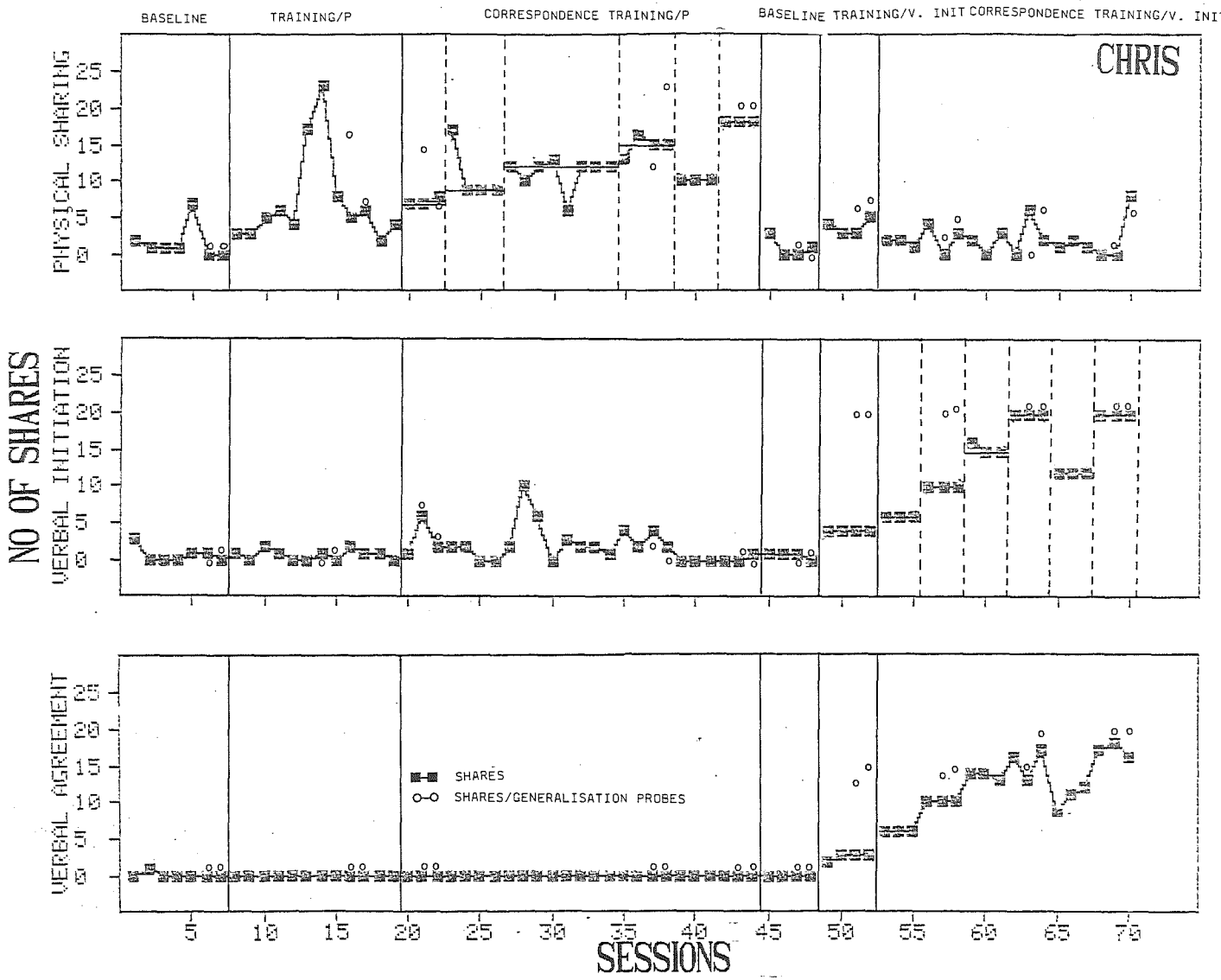
Table 19

Mean and Range of Interobserver Agreement Across all Behaviours and Experimental Conditions

Behaviour	Range	Mean Agreement (%)
Physical - initiation	0-100	95
Physical - ongoing	33-100	96
Verbal - initiation	0-100	98
Verbal - agreement	0-100	98
Share refusal	0-100	96
Inappropriate	0-100	96
Positive social	0-100	89
Independent	0-100	90
Appropriate verbalization	67-100	93
Inappropriate Verbalization	0-100	94
Silence	50-100	95
Other	0-100	90

Figure Caption

Figure 6. Number of verbal agreements, verbal initiations and physical shares across all experimental conditions.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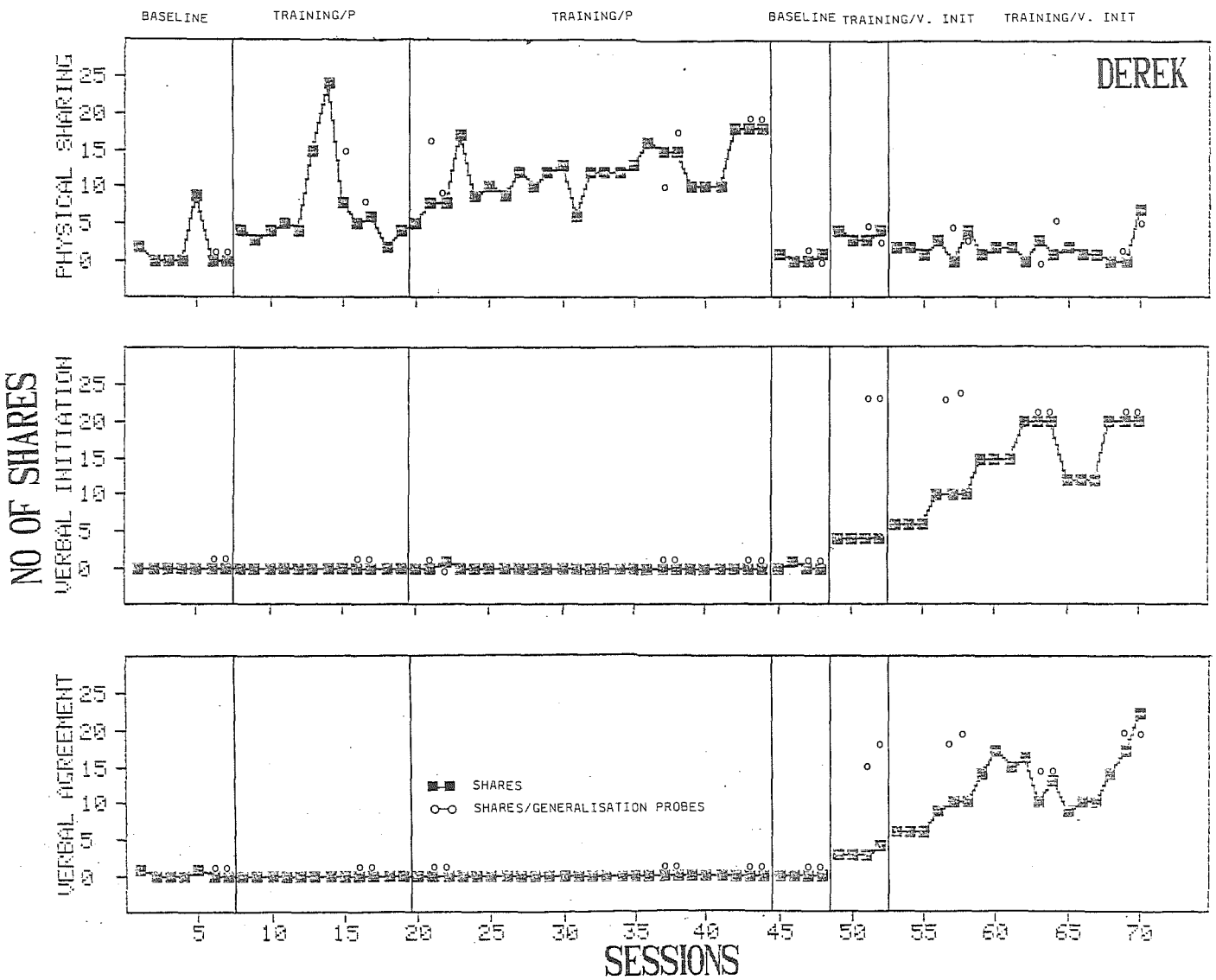
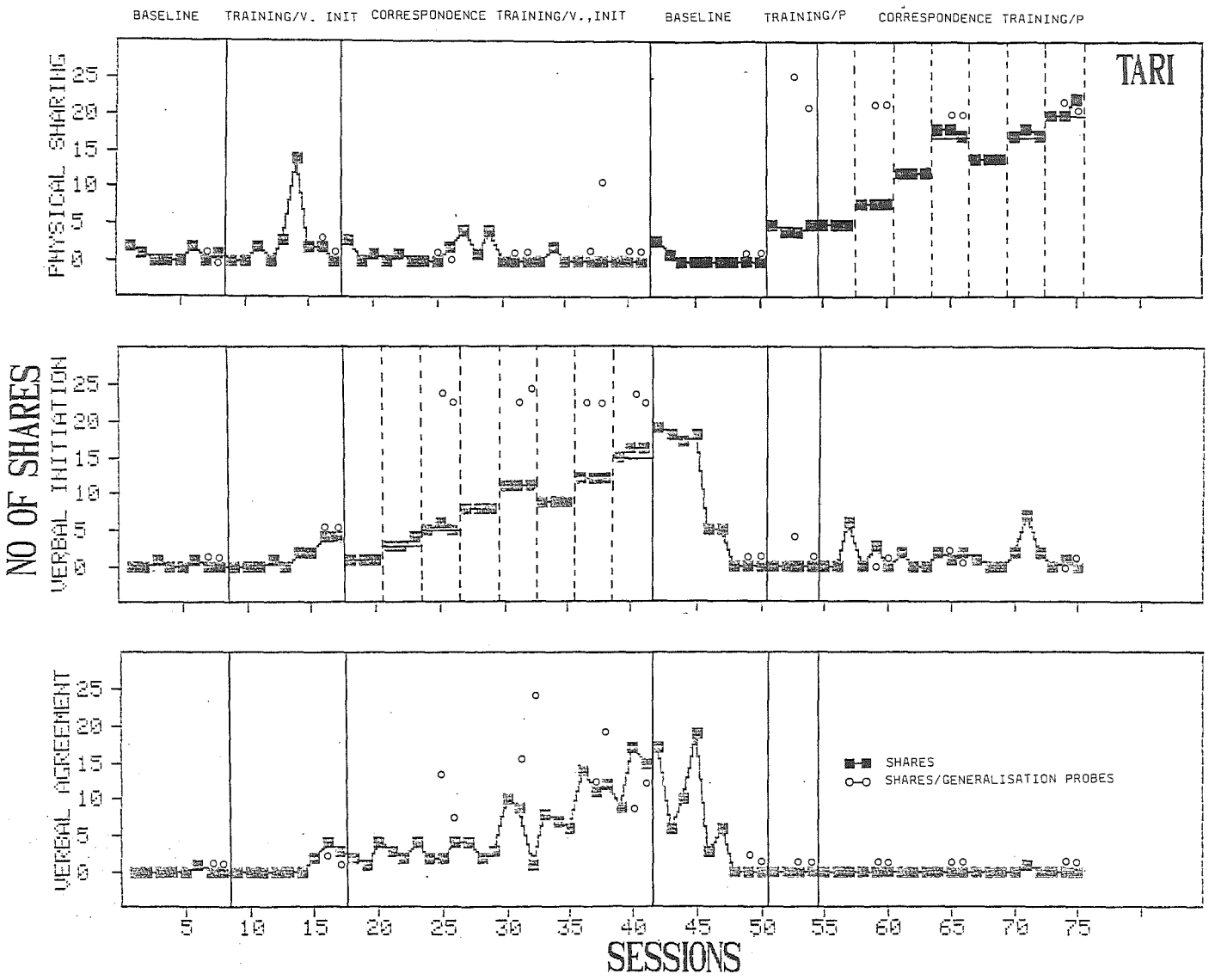
TRAINING/P
CORRESPONDENCE TRAINING/P
BASELINE
TRAINING/V. INIT
CORRESPONDENCE TRAINING/V. INIT
CHRIS
NO OF SHARES
PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
0 5 10 15 20 25
SHARES
SHARES/GENERALISATION PROBES
5 10 15 20 25 30 35 40 45 50 55 60 65 70
SESSIONS


BASELINE
TRAINING/P
TRAINING/P
BASELINE
TRAINING/V. INIT
TRAINING/V. INIT
DEREK
PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
NO OF SHARES
SHARES
SHARES/GENERALISATION PROBES
SESSIONS


BASELINE
TRAINING/V. INIT
CORRESPONDENCE TRAINING/V.,INIT
BASELINE
TRAINING/P
CORRESPONDENCE TRAINING/P
TARI
PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
NO OF SHARES
SHARES
SHARES/GENERALISATION PROBES
SESSIONS

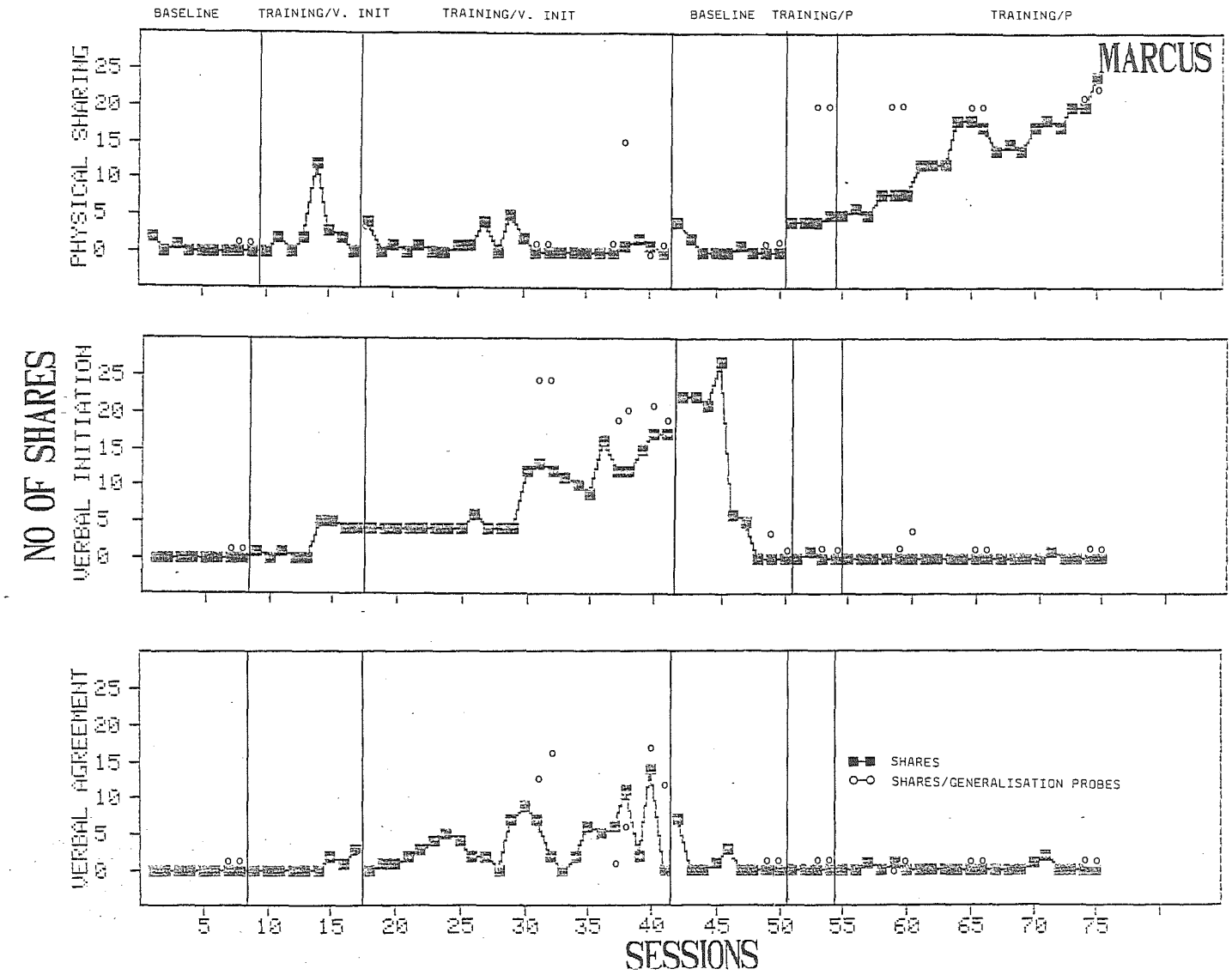

BASELINE
TRAINING/V. INIT
TRAINING/V. INIT
BASELINE
TRAINING/P
TRAINING/P
MARCUS
PHYSICAL SHARING
VERBAL INITIATION
VERBAL AGREEMENT
NO OF SHARES
0 5 10 15 20 25
SHARES
SHARES/GENERALISATION PROBES
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
SESSIONS

Table 20

Mean Levels of Collateral Behaviours Across Phases

CHRIS

Phases	Behaviours: Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	1.4	1.3	0.0	59.5
Training (Phys.)	0.2	0.2	0.1	57.0
Correspondence Criterion = 7	0.3	0.7	0.3	55.7
= 9	0.8	0.0	1.0	54.3
= 12	0.8	0.6	0.4	56.5
= 15	0.8	0.3	0.3	58.5
= 10	0.0	0.3	0.0	60.0
= 18	0.0	0.0	8.0	60.0
Baseline 2	0.3	2.6	0.0	60.0
Training (Verb.)	0.5	0.0	2.5	59.8
Correspondence Criterion = 6	0.0	0.0	4.0	60.0
= 10	0.3	0.7	5.7	60.0
= 15	0.3	0.3	2.7	60.0
= 20	0.0	0.3	2.3	59.6
= 12	0.0	1.0	2.3	60.0
= 20	0.0	0.0	3.7	58.7

Table 20

Mean Levels of Collateral Behaviours Across Phases

DEREK

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.7	0.1	0.0	59.4
Training (Phys.)	0.0	0.0	0.0	56.4
Correspondence Criterion = 7	0.3	0.0	0.3	55.3
= 9	0.0	0.0	0.5	56.0
= 12	0.3	0.0	0.0	56.6
= 15	0.8	0.0	0.0	58.2
= 10	0.0	0.0	0.0	60.0
= 18	0.0	0.0	0.0	60.0
Baseline 2	0.8	0.0	0.0	60.0
Training (Verb.)	0.0	0.0	1.5	59.7
Correspondence Criterion = 6	0.0	0.0	0.0	60.0
= 10	0.3	0.0	0.7	60.0
= 15	0.3	0.0	1.3	60.0
= 20	0.3	0.0	1.7	59.3
= 12	0.3	0.0	1.0	60.0
= 20	0.0	0.0	2.0	59.3

Table 20

Mean Levels of Collateral Behaviours Across Phases

TARI

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.1	0.5	0.1	59.8
Training (Verb)	0.3	2.3	0.8	58.6
Correspondence				
Criterion = 1	0.0	3.3	2.0	59.7
= 3	0.0	5.7	2.0	60.0
= 5	0.0	1.0	2.3	59.7
= 8	0.0	1.7	7.3	59.0
= 11	0.0	2.3	10.3	60.0
= 9	0.3	2.5	11.0	60.0
= 12	0.3	3.3	12.0	60.0
= 15	0.3	6.3	14.7	60.0
Baseline 2	1.7	6.3	7.2	59.8
Training (Phys)	0.0	0.0	1.8	60.0
Correspondence				
Criterion = 5	0.0	3.0	1.7	59.3
= 8	0.0	2.7	2.0	58.0
= 12	0.0	0.0	3.0	59.0
= 17	0.0	0.0	2.0	58.0
= 14	0.0	0.3	5.3	59.7
= 17	0.0	0.0	2.3	58.7
= 20	0.0	0.7	1.3	58.7

Table 20

Mean Levels of Collateral Behaviours Across Phases

MARCUS

Phases	Behaviours			
	Share Refusal	Inappropriate Behaviour	Positive Social	Independent Behaviour
Baseline 1	0.0	3.9	0.1	59.6
Training (Verb)	0.0	7.2	0.7	59.8
Correspondence				
Criterion = 1	1.0	7.7	2.3	59.3
= 3	2.7	6.0	1.0	60.0
= 5	0.0	2.0	0.0	59.7
= 8	1.0	2.3	2.7	58.7
= 11	1.0	0.0	1.0	60.0
= 9	2.7	2.3	1.0	60.0
= 12	2.0	1.0	0.0	60.0
= 15	0.3	2.0	0.3	60.0
Baseline 2	1.3	7.2	1.5	60.0
Training (Phys)	0.3	0.8	1.5	60.0
Correspondence				
Criterion = 5	0.7	3.7	2.0	60.0
= 8	2.7	5.7	0.3	58.7
= 12	0.3	1.0	0.7	60.0
= 17	0.0	0.0	1.0	59.0
= 14	0.7	0.7	2.3	60.0
= 17	0.3	0.3	2.3	59.7
= 20	0.0	0.3	4.3	59.7

observers as to which behaviours warranted the moving of a bead. For these reasons, both initiations and ongoing physical shares were permitted in order to reach the criterion.

Physical Sharing (initiations and ongoing shares combined)

Those boys who received correspondence training (Chris, Tari) showed dramatic increases in the number of physical shares during Phase 3. The remaining two boys (Derek, Marcus) also showed training-related increases in physical sharing, however these changes were variable and less consistent with the criteria. During Baseline 1, all boys displayed low levels of physical sharing. With the introduction of training for physical sharing in phase 2, Chris and Derek increased their number of physical shares, to an average of 4 during Phase 2. The only exceptions were two sessions in the middle of the training phase when the number of shares was higher than 15 for both boys. With the introduction of correspondence training for physical sharing, Chris and Derek steadily increased their number of shares. With a few exceptions, Chris increased his number of shares consistent with each criterion. With the introduction of Baseline 2, both Chris and Derek showed an immediate reduction in physical sharing, reaching close to zero levels. Following a slight increase in physical sharing during phase 5, this behaviour occurred at variable but low rates during the final phase.

For the pair receiving training for verbal sharing first (Tari and Marcus), the number of physical shares remained close to zero during Phases 1, 2, 3, and 4. In Phase 5, when training for physical sharing was introduced both Tari and Marcus showed a slight but stable

increase in this behaviour. In the final phase when correspondence training was introduced for physical sharing, both Tari and Marcus increased their number of shares consistent with each criterion.

Duration of Physical Sharing

The mean duration of physical sharing for each boy is presented in Tables 21 and 22. Chris showed longer durations of sharing during the correspondence training phases, however, as he was required to share more often the length of these shares decreased slightly. For Derek, the mean duration of sharing was variable, with the longest durations occurring during the correspondence training phases. Tari's mean duration of sharing ranged from 0 to 6.7 seconds throughout the experiment, with the longest duration occurring during Baseline 2. During correspondence training for physical sharing, Tari's mean duration of sharing was more consistent, ranging from 2.0 to 3.4 seconds across all criterion levels. The mean duration of shares for Marcus was variable, ranging from 0 to 5.3 seconds. The highest scores occurred during the first half of phase 3, when correspondence training was implemented for verbal sharing, and during Baseline 2.

Insert Tables 21 and 22 about here

Verbal Sharing - initiations

All four boys showed a significant increase in the number of verbal initiations as a result of training. This behaviour occurred at near zero levels during Baseline 1, with the number of verbal initiations never exceeding 3. For the pair who received training in

Table 21

The Mean Duration of Physical Shares Across Phases

	CHRIS	DEREK
Baseline 1	2.1	3.9
Training (Phys.)	5.4	3.6
Correspondence		
Criterion = 7	6.0	6.1
= 9	4.8	4.6
= 12	4.1	3.9
= 15	2.8	2.7
= 10	1.7	1.7
= 18	1.7	1.1
Baseline 2	1.7	1.4
Training (Verb.)	1.7	1.5
Correspondence		
Criterion = 6	1.5	1.3
= 10	2.7	1.8
= 15	1.6	1.8
= 20	3.7	5.2
= 12	3.1	2.1
= 20	4.5	4.2

Table 22

The Mean Duration of Physical Shares Across Phases

	TARI	MARCUS
Baseline 1	1.0	1.2
Training (Verb.)	1.7	1.2
Correspondence		
Criterion = 1	3.9	3.9
= 3	6.4	4.9
= 5	5.4	4.5
= 8	3.0	4.7
= 11	0.0	1.0
= 9	1.9	0.0
= 12	0.6	1.2
= 15	0.0	0.9
Baseline 2	6.7	5.3
Training (Phys.)	1.4	1.0
Correspondence		
Criterion = 5	2.3	1.0
= 8	3.4	2.9
= 12	2.2	1.5
= 17	3.0	2.8
= 14	2.0	1.9
= 17	2.4	2.0
= 20	2.7	1.9

verbal sharing first (Tari and Marcus) this behaviour increased to a maximum of 5 during the training phase. With the introduction of correspondence training in phase 3, Tari increased his number of verbal initiations to match each criterion level. During the correspondence training phase, Tari never failed to meet a criterion. In addition, he never exceeded a criterion by more than one data point. Marcus averaged 4 verbal initiations during the first half of the correspondence phase, after which period his verbal initiations increased to higher levels. During this phase, the number of verbal initiations for Marcus was variable rather than criterion-consistent. During Baseline 2, both Tari and Marcus initially showed high levels of verbal initiations. However, after four baseline sessions, this behaviour decreased to near-zero levels and remained at this level for Phases 5 and 6. The only exceptions occurred with Tari, who initiated 6 and 7 verbal shares during the final phase of the experiment.

Those boys who received training for verbal initiations in the second half of the experiment (Chris and Derek) displayed low levels of this behaviour during Phases 1, 2, 3, and 4. Derek's number of verbal initiations remained at zero for all but two sessions during this period. Chris' number of responses was more variable, reaching a maximum of 10 verbal initiations during phase 3. When training for verbal initiations was introduced in Phase 5, both Chris and Derek increased their number of verbal initiations to 4 per session. With the implementation of correspondence training in the final phase of the experiment, the two boys increased their number of verbal initiations so that they were 100% consistent with each criterion level.

Verbal Sharing - agreements

All boys showed near-zero levels of verbal agreement during Phases 1 and 2 of the experiment. The maximum number of verbal agreements during these Phases was 4. With the introduction of correspondence training in Phase 3, both Tari and Marcus showed increased but variable levels of this behaviour. The highest number of shares was exhibited by Tari who reached a maximum of 17 verbal agreements at the end of Phase 3. During Baseline 2, Tari and Marcus showed a reduction in this behaviour to near zero levels. The number of verbal agreements remained at near zero levels for the final two phases.

With the exception of one or two data points, Chris and Derek displayed zero rates of verbal agreement during Phases 1, 2, 3, and 4. When training was introduced for verbal initiations in Phase 5, the number of verbal agreements averaged 4 for both Chris and Derek. The implementation of correspondence training in Phase 6 resulted in higher levels of verbal agreements for both boys.

Share Refusal

All boys displayed near-zero levels of share refusal throughout the experiment.

Inappropriate Behavior

Inappropriate behaviour occurred at low levels throughout the experiment; the highest mean score for this behaviour was 7.7.

Positive Social

All boys showed increases in positive social behaviour as a result of correspondence training. Chris showed no positive social behaviour during both baseline phases. When correspondence training for physical sharing was implemented, this behaviour increased slightly. During training and correspondence training phases for verbal sharing, Chris showed a consistent increase in this behaviour, with a range of 2.3 to 5.7 responses. Derek's highest mean number of positive social behaviour was 0.5 during the first four phases of the experiment, increasing slightly when training and correspondence training for verbal sharing were introduced. For Tari, the lowest rates of positive social behaviour occurred during the first two phases of the experiment. With the introduction of correspondence training for verbal sharing, positive social behaviour showed a substantial increase, with the mean number of responses ranging from 2.0 to 14.7 per session. The mean number of positive responses remained high during Baseline 2, however with the introduction of training for physical sharing, this behaviour returned to low levels. During the final Phase, when correspondence training was provided for physical sharing, the mean number of positive social responses ranged from 1.3 to 5.3. Marcus also engaged in low levels of positive social behaviour during Baseline 1 and the training Phase for verbal sharing. When correspondence training was introduced in Phase 3, positive social behaviour remained at low levels. It was only in the final three criterion levels of correspondence training for physical sharing that Marcus displayed higher rates of positive social behaviour.

Independent Behaviour

There was little change in the mean number of independent behaviour throughout the study across all subjects.

Appropriate Verbalizations

Table 23 displays the mean number of verbalizations for each boy across all phases of the experiment. All boys showed a substantial increase in the mean number of appropriate verbalizations following Baseline 1. Chris had a mean of 7.3 appropriate verbalizations during Baseline 1, which increased to 12.8 when training for physical sharing was implemented. When correspondence training was introduced, the mean number of responses ranged from 19.0 to 33.7 across criterion levels. During Baseline 2, training for verbal sharing, and the first criterion level for correspondence training, mean levels of appropriate verbalization decreased, varying between 12.0 and 16.0. However, in the final five criterion levels of correspondence training, this behaviour increased again, with a range of 21.7 to 38.3 responses per session. Derek had low rates of appropriate verbalization during Baseline 1 and training for physical sharing, but these rates increased for the majority of criterion levels during correspondence training. In Baseline 2, the mean number of appropriate verbalizations was still high (15.0), and in the training for verbal sharing phase, it decreased to 9.8. When correspondence training was implemented for verbal sharing, the mean number of appropriate verbalizations increased, ranging from 13.7 to 29.7 per session. Tari's Baseline 1 rate of appropriate verbalizations was 5.8, however this behaviour tripled at least, during all subsequent phases. The highest rates were evident during the correspondence

training Phase for verbal sharing, when appropriate verbalizations reached a maximum of 53.0 responses per session. Marcus also increased his mean number of appropriate verbalizations following Baseline 1. The mean number of responses ranged from 23.8 to 50.0 during all experimental phases apart from Baseline 1 when the mean number of responses was 12.6.

Insert Table 23 about here

Inappropriate Verbalizations

This behaviour occurred at low levels for all boys throughout the experiment.

Generalization

Table 24 displays the mean number of all behaviours during generalization sessions. The generalization data showed similar trends to the data collected in the first setting. All boys showed increases in physical sharing in the second setting when training and correspondence training for physical sharing were implemented. The mean number of physical shares was 22.5. These increases were not apparent during Baseline 1 and 2 or during training phases for verbal sharing. When training and correspondence training were implemented for verbal initiations, this behaviour also showed a substantial increase, ranging from 4.0 to 20.5 responses per session in the generalization setting. The mean number of verbal agreements increased concurrently, with a maximum of 19.5 responses. The mean number of share refusals remained close to zero during generalization

Table 23

Mean Number of Verbalizations Across Phases

CHRIS

Phases	Behaviours			
	Appropriate	Inappropriate	Silence	Other
Baseline 1	7.3	0.4	51.7	0.9
Training (Phys.)	12.8	0.3	42.7	5.5
Correspondence				
Criterion = 7	23.7	0.0	31.0	6.7
= 9	23.0	0.0	36.8	0.8
= 12	20.5	0.0	37.5	2.5
= 15	29.0	0.0	29.5	1.0
= 10	19.0	0.0	40.3	2.7
= 18	33.7	0.0	23.7	4.0
Baseline 2	16.0	0.0	43.5	0.8
Training (Verb.)	12.8	0.0	45.5	1.8
Correspondence				
Criterion = 6	12.0	0.0	47.3	0.7
= 10	21.7	0.0	37.0	2.0
= 15	23.7	0.0	36.3	0.0
= 20	28.0	0.0	29.3	4.0
= 12	38.3	0.0	12.3	15.7
= 20	34.7	0.0	11.7	27.0

Table 23

Mean Number of Verbalizations Across Phases

DEREK

Phases	Behaviours			
	Appropriate	Inappropriate	Silence	Other
Baseline 1	3.9	0.1	54.3	2.0
Training (Phys.)	5.1	0.3	47.3	2.8
Correspondence				
Criterion = 7	21.0	0.0	31.3	9.0
= 9	27.0	0.0	28.8	7.8
= 12	11.8	0.0	44.7	6.0
= 15	11.5	0.0	39.8	11.5
= 10	2.3	0.0	56.0	2.0
= 18	4.3	0.0	49.3	6.7
Baseline 2	15.0	0.0	33.5	12.0
Training (Verb.)	9.8	0.0	45.5	5.0
Correspondence				
Criterion = 6	13.7	0.3	45.7	0.7
= 10	15.0	0.0	44.0	1.3
= 15	25.7	0.0	29.3	6.7
= 20	29.7	0.0	28.7	4.0
= 12	25.7	0.0	11.0	28.7
= 20	22.3	0.0	7.0	34.7

Table 23

Mean Number of Verbalizations Across Phases

TARI

Phases	Behaviours			
	Appropriate	Inappropriate	Silence	Other
Baseline 1	5.8	0.3	54.1	0.1
Training (Verb.)	29.9	1.0	27.8	3.6
Correspondence				
Criterion = 1	44.3	1.0	15.0	1.3
= 3	53.0	4.0	4.3	3.3
= 5	46.7	0.3	12.0	6.0
= 8	33.7	0.0	21.7	6.7
= 11	38.3	0.3	15.3	10.7
= 9	43.7	0.0	7.7	12.7
= 12	29.0	0.7	19.3	16.7
= 15	41.3	2.0	3.0	29.0
Baseline 2	23.3	3.2	12.0	29.6
Training (Phys.)	25.3	0.0	8.0	32.5
Correspondence				
Criterion = 5	30.7	2.3	20.3	11.3
= 8	23.7	0.3	14.7	22.7
= 12	21.3	0.7	9.7	33.0
= 17	23.7	0.0	29.7	8.0
= 14	43.7	1.7	4.7	26.0
= 17	35.0	0.3	20.7	7.7
= 20	27.3	0.3	30.7	2.7

Table 23

Mean Number of Verbalizations Across Phases

MARCUS

Phases	Behaviours			
	Appropriate	Inappropriate	Silence	Other
Baseline 1	12.6	0.9	31.0	19.5
Training (Verb.)	35.1	1.4	14.7	20.9
Correspondence				
Criterion = 1	42.7	0.7	5.0	25.0
= 3	50.0	5.3	3.0	12.7
= 5	44.7	2.7	4.7	21.0
= 8	43.0	2.3	3.7	28.7
= 11	42.3	2.0	3.7	28.7
= 9	46.3	2.0	0.7	32.0
= 12	36.3	0.7	6.3	32.0
= 15	43.3	2.3	1.3	32.0
Baseline 2	31.2	5.3	4.3	30.7
Training (Phys.)	23.8	2.3	10.8	27.8
Correspondence				
Criterion = 5	39.3	3.3	13.0	12.0
= 8	31.3	2.7	12.3	17.3
= 12	26.7	1.0	9.7	25.7
= 17	40.3	0.7	9.0	12.3
= 14	39.0	1.7	4.0	29.7
= 17	33.7	1.0	22.0	9.0
= 20	32.0	0.3	20.0	17.0

probes. The maximum number of share refusals was 4.0, which occurred during correspondence training for verbal sharing.

Insert Table 24 about here

Inappropriate behaviour generally occurred at low levels. The maximum number of inappropriate responses occurred during Baseline 1, when Marcus averaged 31.0 responses per session. In all other cases, the mean number of inappropriate responses remained below 4.1. Positive social behaviour occurred more frequently in the generalization setting when training and correspondence training were provided. For all boys, the mean number of positive social responses during Baseline 1 And Baseline 2 was below 0.6. The maximum number of responses was 24.5, which occurred during correspondence training for verbal sharing. Independent behaviour followed the same trend in both the first and second settings. Overall, this behaviour remained at high levels decreasing slightly when correspondence training for physical sharing was implemented.

Appropriate verbalizations occurred at low rates during Baseline 1, with a maximum number of 9.5 responses per session. With the implementation of training and correspondence training phases, this behaviour increased dramatically in the second setting. The maximum number of appropriate verbalizations was 56.0, when correspondence training for verbal sharing was implemented. Inappropriate verbalizations occurred at low levels in the second setting, with a maximum of 6.5 responses per session when correspondence training for verbal sharing was implemented. As in the first setting, the mean

Table 24

Generalization Probes: Mean Number of Responses Across Phases

CHRIS

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	7.0	1.0
Training	11.0	1.0	0.0	0.0	0.5	0.5	54.5	20.5	2.5
Corr.= 7	11.0	4.5	0.0	3.5	0.0	0.5	57.0	24.0	2.5
= 9	----	----	----	----	----	----	----	----	----
= 12	----	----	----	----	----	----	----	----	----
= 15	17.0	1.0	0.0	0.0	0.0	2.0	59.5	28.0	0.0
= 10	----	----	----	----	----	----	----	----	----
= 18	20.0	0.0	0.0	0.5	0.0	6.0	58.0	22.5	0.0
Baseline	0.5	0.0	0.0	0.5	0.5	0.0	60.0	8.5	0.0
Training	6.5	20.0	17.5	0.0	0.0	13.0	60.0	33.5	0.0
Corr.= 6	----	----	----	----	----	----	----	----	----
= 10	4.0	20.5	18.0	0.0	0.5	6.0	60.0	32.0	0.0
= 15	----	----	----	----	----	----	----	----	----
= 20	2.5	20.5	14.5	0.5	0.0	2.5	59.5	33.0	0.0
= 12	----	----	----	----	----	----	----	----	----
= 20	2.0	20.0	19.0	0.0	0.0	4.0	59.0	31.5	0.0

Key: ---- = Generalization Probes not taken for that phase

Table 24

Generalization Probes: Mean Number of Responses Across Phases

DEREK

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	0.0	0.0	0.0	60.0	5.0	0.0
Training	11.0	0.0	0.0	1.0	0.5	0.5	55.5	7.0	0.5
Corr.= 7	12.0	0.0	0.0	0.0	0.0	0.5	57.5	10.0	0.0
= 9	----	----	----	----	----	----	----	----	----
= 12	----	----	----	----	----	----	----	----	----
= 15	14.0	0.0	0.0	0.0	0.0	0.0	60.0	12.0	0.0
= 10	----	----	----	----	----	----	----	----	----
= 18	20.0	0.0	0.0	0.0	0.0	0.0	58.0	7.5	0.0
Baseline	0.5	0.0	0.0	0.0	0.5	0.0	60.0	8.0	0.0
Training	4.5	20.0	16.0	0.0	0.0	9.0	60.0	33.0	0.0
Corr.= 6	----	----	----	----	----	----	----	----	----
= 10	3.5	20.5	19.5	0.5	0.0	2.5	60.0	34.0	0.0
= 15	----	----	----	----	----	----	----	----	----
= 20	2.5	20.0	14.0	0.0	0.0	1.5	59.0	36.0	0.0
= 12	----	----	----	----	----	----	----	----	----
= 20	2.0	20.0	19.0	0.0	0.0	1.5	59.0	23.0	0.0

Key: ---- = Generalization Probes not taken for that phase

Table 24

Generalization Probes: Mean Number of Responses Across Phases

TARI

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	1.5	0.5	0.0	60.0	8.5	0.5
Training	1.5	4.0	1.0	0.0	2.5	0.5	58.5	38.0	0.0
Corr.= 1	----								
= 3	----								
= 5	0.5	20.5	11.0	0.0	0.5	10.0	60.0	41.0	0.5
= 8	----								
= 11	0.0	21.0	17.0	0.0	0.0	18.5	60.0	44.5	1.0
= 9	----								
= 12	5.5	20.5	9.0	0.5	1.0	24.5	60.0	39.0	2.0
= 15	0.0	20.5	10.5	0.0	0.5	11.5	60.0	41.5	1.0
Baseline	0.5	0.0	1.0	0.0	4.0	0.0	60.0	27.0	1.0
Training	22.5	2.0	0.0	0.0	0.0	2.0	60.0	26.5	0.0
Corr.= 5	----								
= 8	21.0	0.0	0.0	0.0	0.0	6.0	60.0	31.0	0.0
= 12	----								
= 17	17.0	0.5	0.0	0.0	0.5	5.0	60.0	17.5	1.0
= 14	----								
= 17	----								
= 20	21.0	0.5	0.0	0.0	0.0	2.0	57.0	37.5	1.0

Key: ---- = Generalization Probes not taken for that phase

Table 24

Generalization Probes: Mean Number of Responses Across Phases

MARCUS

	Physical Shares	Verbal Init.	Shares Agree.	Share Refus.	Inapp. Behav.	Pos. Social	Indep. Behav.	Verbalization App.	Verbalization Inapp.
Baseline	0.0	0.0	0.0	1.0	31.0	0.5	60.0	9.5	2.5
Training	1.0	4.5	3.0	0.0	4.0	2.5	60.0	46.0	1.5
Corr.= 1	----	----	----	----	----	----	----	----	----
= 3	----	----	----	----	----	----	----	----	----
= 5	0.5	20.0	7.0	0.5	0.5	0.5	60.0	51.0	2.0
= 8	----	----	----	----	----	----	----	----	----
= 11	0.0	25.0	15.0	4.0	0.0	0.0	60.0	56.0	2.5
= 9	----	----	----	----	----	----	----	----	----
= 12	8.5	20.5	3.5	0.0	2.0	0.0	60.0	38.5	6.5
= 15	0.5	21.0	14.5	1.0	1.0	0.5	60.0	37.5	2.0
Baseline	0.5	2.0	0.0	0.0	2.5	0.0	60.0	23.0	2.5
Training	20.0	0.5	0.0	1.0	0.0	0.5	60.0	37.0	0.5
Corr.= 5	----	----	----	----	----	----	----	----	----
= 8	20.0	2.0	0.0	0.0	0.0	1.0	60.0	40.5	1.5
= 12	----	----	----	----	----	----	----	----	----
= 17	17.0	0.0	0.0	0.5	1.0	2.5	60.0	39.0	0.5
= 14	----	----	----	----	----	----	----	----	----
= 17	----	----	----	----	----	----	----	----	----
= 20	21.5	0.0	0.0	0.5	0.5	3.0	57.5	41.5	1.0

Key: ---- = Generalization Probes not taken for that phase

number of inappropriate verbalizations was low but variable throughout the experiment.

Assessment of the Independent Variable

The systematic manipulation of the independent variable was assessed throughout the experiment. All prior-to-play and after-play sessions were assessed. Prior-to-play sessions were divided into four segments, which were scored in terms of occurrence or nonoccurrence. After-play sessions involved a total of nine measures, of which only three were possible for a particular session. Tables 25 and 26 illustrate the format of the data sheets used to assess the consistency of the independent variable.

Insert Tables 25 and 26 about here

Trainer 1 was responsible for administering the training procedure to Chris. The results indicated that Trainer 1 was 100% accurate in her delivery of the training talks during prior-to-play sessions and in the administration of after-play talk sessions. Trainer 2 was responsible for the training of Derek. She made a total of two errors during the prior-to-play sessions. Both errors involved the substitution of another boy's name for the name of the boy receiving training. An additional name-substitution error was made by Trainer 2. However, this error was not counted, since Derek himself corrected the trainer! A total of two errors were made in the after-play sessions. One involved the use of the word "all" instead of "any" in the question: "Did you move any of the beads over to the other side

Table 25

Prior to Play Sessions for Physical Sharing

Session:	1	2	3	4	5	6	7	8	9	10
Date:										
Boy's Name:										
This is a counter. Every time you share with --, move one bead over. Now you try.										
Say you just tried to share with --, what do you do next?										
Say you just went over to -- and helped him with his toys. What do you do next?										
Remember to move a bead over each time you try to share the toys with --.										

Table 26

After Play Session for Physical Sharing

Session:	1	2	3	4	5	6	7	8	9	10
Date:										
Boy's Name:										
Did you move any beads over to the other side today?										
Did you move all the beads over to the other side today?										
That's right. You really did move some beads over.										
That's right. You really did move all the beads over.										
That's right. You didn't move any beads over.										
Good boy!										
But you didn't really move any beads over, did you?										
But you didn't really move all the beads over, did you?										
See if you can try harder tomorrow.										

today?" The second error occurred when Derek failed to move any beads over in a session, and Trainer 2 omitted the words: "See if you can try harder tomorrow". Trainer 3 administered training to Tari. This trainer was 100% accurate in her delivery of the prior-to-play training procedures and the after-play training procedures. Trainer 4 was responsible for the training of Marcus. The results indicated that this trainer made a mistake in one prior-to-play session. In this case, the words: "Remember to move a bead over each time you ask Tari to share" were omitted. In the after-play sessions, a total of three errors occurred. On two occasions, Trainer 3 substituted the word, "all" for "any" in the sentence: "Did you move any of the beads over to the other side today?" On the third occasion, the word "all" was substituted for the words "some of" in the sentence: "That's right. You really did move some of the beads over." Overall, there were few errors made during prior-to-play and after-play sessions.

DISCUSSION

The results of Experiment 7 showed that do-say correspondence training was highly effective in the facilitation of verbal and physical sharing. Both the trained and untrained participants displayed large improvements in sharing and collateral behaviours. During the first correspondence training phase (Phase 3), the two trained participants showed slightly more adherence to the criterion levels set than did the untrained participants. However, when correspondence training was introduced for the second time (Phase 6) all boys, trained and untrained, were sharing at rates which were

highly consistent with each criterion. These results are consistent with previous studies which showed that when correspondence training is used to train one target behaviour, this will facilitate the training of subsequent behaviours (Baer et al.,1984; Ralph & Birnbrauer, 1986). The frequency of verbal sharing (initiations) increased when physical sharing was the target behaviour for correspondence training, and vice versa. For all four participants, the frequency of verbal agreements increased dramatically when correspondence training was provided for verbal initiations.

The finding that do-say correspondence training is effective is consistent with the findings of previous studies. These have demonstrated the utility of this procedure in the facilitation of appropriate behaviours (Jewett & Clark, 1979; Risley & Hart, 1968). Two investigations have indicated that the do-say sequence facilitated physical sharing (Rogers-Warren & Baer, 1976; Rogers-Warren et al., 1977). However, both studies evaluated the procedure with children of normal intelligence. In addition, reinforcement consisted of both edible and social reinforcement. The present experiment extends the findings to mildly mentally retarded children and shows that social reinforcement alone is sufficient to maintain high levels of sharing. This finding has important implications given the current concern regarding the programming of maintenance and generalization (Stokes & Baer, 1977).

Verbal sharing increased to high levels for both trained and untrained participants. Previous do-say studies have failed to provide data on verbal sharing as an independent variable (i.e., Rogers-Warren & Baer, 1976; Rogers-Warren et al., 1977). Rogers-

Warren and Baer (1976) grouped verbal sharing and physical sharing under the same behavioural category and failed to report data for verbal sharing individually. They commented that "most" exchanges of materials were arranged verbally. Warren et al. (1976) employed positive reinforcement to increase the rate of share offers made by preschool children. Each verbal share offer and acceptance had to backed up with the actual sharing behaviour, hence a functional relationship had to exist. These researchers found a negative relationship between the number of share offers and share acceptances. Again, no individual data were presented for verbal and physical sharing. Thus, little is known regarding the effects of training physical sharing on verbal initiations and acceptances. The present experiment provides more detailed information regarding the nature of verbal sharing. The results show that as the rate of verbal initiations increased, the rate of verbal agreements also increased but the number of physical shares remained at low levels. These findings support those of Warren et al. (1976) since they indicate that actual shares are not increased as a result of high rates of verbalizations.

Barton and Ascione (1979) used a training package to teach sharing to three groups of preschool children. Group 1 received training for verbal sharing, Group 2 were taught physical sharing, and Group 3 received training for verbal and physical sharing together. A fourth group served as a control group, which received no training. When training was implemented, Groups 1, 2, and 3 all increased their levels of physical sharing. However, generalization of sharing responses across settings occurred only in the groups which had

received training for verbal sharing (Groups 1 and 3). One possible reason for the high levels of physical sharing as a result of verbal sharing is that the subjects had sufficient cognitive ability to comprehend the meaning of verbal shares and to reciprocate. In the present experiment, the training of physical sharing was superior to the training of verbal sharing since the former technique produced more actual sharing. The difference in findings between the present experiment and that of Barton and Ascione may be explained by the difference in the two subject populations. In this experiment, the participants were mildly mentally retarded and were less likely to understand the relationship between words and actions. Previous studies lend support to this theory with the finding that speech comes to regulate behaviour as the child grows older (Luria, 1961; Vygotsky, 1962).

An interesting result of this experiment is that both the untrained participants learned to share at high rates. There are several possible reasons for this. The first relates to the fact that in practice, the training program for the untrained participants was essentially the same as the procedure for the correspondence-trained participants. In theory, the two procedures were different since in one the untrained boys were asked if they had moved any of their beads over and were reinforced for moving one or more beads over. In the other procedure (correspondence training) the trained boys were asked if they had moved all their beads over and were reinforced only if all their beads had been moved. However, in practice, the untrained participants rarely failed to move all their beads over during play sessions; hence they were reinforced for this behaviour. To the

untrained participants, it may have appeared that reinforcement was based on moving all the beads over. Further, it is unlikely that they noticed the use of the word "any" in the sentence "Did you move any of the beads over to the other side today?" Thus, they considered their goal to be the movement of all beads.

One of the untrained boys (Marcus) laughed whenever he was instructed to move a bead over for sharing. For this participant, the mastery of the task in itself appeared to be quite exciting. It is possible that some mentally retarded children are used to failing in learning situations and for this reason, they are astonished when they find they are succeeding in a task. One reason why the untrained boys may have been motivated to move all their beads over in the first place is that they noticed that their trained peers were doing this. Both of the untrained participants (i.e., Marcus, Derek) observed their partners closely during the initial play sessions when training had been introduced. The trained participants, Tari and Chris, acted as informal models for the target behaviours. In addition, they offered advice to their untrained partners regarding ways to share and when to move a bead over. Rogers-Warren and Baer (1976) also noticed the presence of informal, unprogrammed peer models in their investigation. A small number of model subjects were observed to instruct and encourage peers who were also receiving correspondence training. In the present experiment, the correspondence-trained participants served as models for the untrained participants while in the study by Rogers-Warren and Baer all subjects received correspondence training. It is difficult to ascertain whether this spontaneous modeling occurred as a result of sharing training or not.

However, it is conceivable that the newly acquired sharing skills generalized to other helpful responses in the form of spontaneous assistance to children who did not understand the procedure. It remains to be seen whether this spontaneous modeling occurs with children who receive correspondence training for other target behaviours.

Whitman et al. (1984) pointed out that the do-say procedure necessitates a certain receptive and expressive linguistic ability on the part of the child and that the child must be able to comprehend questions regarding how s/he behaved in the past. It was apparent from the data of this experiment that all four mentally retarded participants understood what was required of them. Since reinforcement was based specifically on the quantity of beads which had been moved, it was crucial that the boys understood that the beads represented sharing behaviour. The ability to report accurately about past behaviour and to understand the relationship between the beads and sharing behaviour constitutes a complex cognitive task. The concepts involved are quite abstract. The fact that all four boys showed dramatic behavioural gains is surprising. One factor which might account for this finding is that the boys were classified as mildly mentally retarded and were in the age range of 9 to 11 years. Rogers-Warren and Baer (1976) reported that in their experiments, the subjects who acquired the reporting and target behaviours faster appeared to be more verbally and socially skilled. In addition, they were older; younger subjects took longer to report and perform the target behaviours.

One way in which previous do-say studies differ from the present

one is with respect to the timing of instructions. In the present experiment, the subjects received a prior-to-play talk regarding the nature of physical or verbal sharing. They were then given the opportunity to perform the specified behaviours. Finally, they were asked whether or not they had performed the target response. This procedure was employed because it was considered to more closely equate say-do procedures. It meant that both say-do and do-say sequences involved a prior-to-play and after-play talk.

Positive social behaviour increased when correspondence training was introduced, with the trained boys engaging in higher rates of positive social behaviour than their partners. It is interesting to note that since the mean percent of positive social behaviour was only 0.1 during Baseline 1, one might assume that all four boys had severe social skills deficits and were in need of social skills training to ameliorate this problem. However, they subsequently demonstrated that they were capable of engaging in positive social behaviour. The fact that these skills developed without specific programming is encouraging for future research.

One explanation for the increases in positive social behaviour which were evident in the present experiment is that response generalization occurred. It is possible that the target behaviours (i.e., verbal initiations, physical sharing) generalized to other positive response categories. Alternatively, it could be that the sharing behaviours themselves served as prompts for the participants to engage in positive social behaviour. For instance, when one child shared with another or invited his partner to share, these actions might cause the latter child to reciprocate with a smile or the word,

"thanks". Anecdotal evidence suggests that this was the case since positive social behaviours generally occurred during or immediately following a sharing response.

The explanations of response generalization and sharing-prompted positive behaviour are not incompatible. The central question remains: How does response generalization (or behaviour-prompting) occur? Some researchers have suggested that generalization is enhanced with correspondence training procedures because the subject is not able to perceive when and where reinforcement will be delivered (Whitman et al., 1982). Another possible reason why generalization occurs is that one behaviour (e.g., sharing) cues another (e.g., smiling) and that both these social responses are subsequently reinforced. This process may be similar to that of chaining and respondent conditioning due to the fact that the delayed reinforcement component of correspondence training serves to strengthen a number of related behaviours.

This theory would also provide an explanation for the finding that generalization and maintenance effects are enhanced by correspondence training. It is possible that the children who participate in correspondence training studies are not aware that reinforcement is provided contingent upon a single (target) behaviour. Instead, the subjects may perceive that it is a whole group of behaviours which must be displayed before reinforcement is delivered. The time delay may serve to perpetuate this myth since the child may think s/he has to perform a series of behaviours rather than just the target one. Mentally retarded children are particularly susceptible to this misconception, since they are more likely to be confused as to the

nature of reinforcement. The notion of superstitious behaviour may also be relevant to this theoretical explanation. In other words, the child may be unsure of what the target behaviour comprises and may utilize the time provided to engage in a number of related behaviours in order to maximize his/her chances of reinforcement. Further research is needed to isolate these variables and to evaluate their effects.

Appropriate verbalizations increased as a result of correspondence training for verbal and physical sharing. These results were encouraging, given that two participants had severe speech disabilities (i.e., Derek, Marcus). Both boys successfully learnt to verbalize share initiations. In addition, they were motivated to speak more during play sessions, an activity which was beneficial since it allowed them to practise appropriate speech patterns. The observations and tape recordings revealed that Marcus' partner spontaneously corrected Marcus' verbalizations throughout the experiment. These corrections appeared to discourage Marcus during Baseline 1, when he often became silent following a correction. However, when training for verbal sharing was introduced he often repeated words/phrases after Tari, apparently in an attempt to perfect his pronunciation of the verbal shares. This led to an increase in Marcus' verbal behaviour which was maintained during all phases following Baseline 1.

The acquisition and subsequent use of appropriate verbal behaviour is of central importance to social skills. Deficiencies in verbal skills can affect a child's later success in school and society (Bereiter & Engelmann, 1966). Few studies have been conducted in

which appropriate verbalization has been assessed. However, researchers who have trained independent play or social skills have reported that appropriate verbalizations also increased (Buell et al., 1968; Foxx et al., 1984; Keogh et al., 1984). It is unclear as to whether the increases in appropriate verbalizations were a result of increased sharing levels or the correspondence training effects (of being reinforced for accurate reporting).

Negative collateral behaviours (i.e., share refusal, inappropriate behaviour, inappropriate verbalizations) did not change dramatically when correspondence training was implemented. Two of the participants had low, stable rates of negative behaviour throughout the experiment (i.e., Chris, Derek). The remaining two participants engaged in more variable rates of negative behaviour (Tari, Marcus).

This experiment showed that the boys' behaviours generalized across settings in the absence of specific training. Both the trained and untrained participants exhibited positive changes in sharing and collateral behaviours in the generalization setting. Generalization to the second setting occurred only when training for sharing was implemented. Previous studies of correspondence training have failed to include the assessment of generalization (e.g., Israel & Brown, 1977; Israel & O'Leary, 1973; Rogers-Warren et al., 1977; Risley & Hart, 1968). However, two recent investigations examined the problem of generalization following corresponding training and found that it could be effected in extra-training settings (Ralph & Birnbrauer, 1986; Whitman et al. 1982). One explanation for the generalized effects which occurred in the present experiment is that the presence of the counting beads may have served as discriminative stimuli which

cued sharing behaviour.

GENERAL DISCUSSION

Experiments 1 to 4 demonstrated that antecedent events did not influence sharing levels. In Experiment 1, the laboratory experiment revealed low levels of sharing by 62 mildly mentally retarded boys. Experiment 2 showed that there was little difference in the percentage of shares between laboratory and classroom settings. The nine participants engaged in low percentages of sharing across all phases of the experiment and there were no socially significant changes in sharing or collateral behaviours. In Experiments 3 and 4 the effects of familiar versus novel toys and few versus many play materials were assessed. These antecedent variables were found to have no consistent effect on the degree of sharing.

Experiment 5 was designed to investigate the effects of consequent events on sharing and social responses of mentally retarded children. The results showed that both individual and group reinforcement contingencies produced substantial increases in physical sharing. Experiments 6 and 7 were designed to investigate the effects of two cognitive behavioural procedures involving social reinforcement on physical and verbal sharing. Once again, consequent events proved to be highly effective in the facilitation of sharing in mentally retarded children. Collectively, Experiments 5, 6, and 7 indicate that training procedures involving reinforcement may be more effective in the facilitation of sharing with mentally retarded children than antecedent events alone.

There are a number of possible reasons why the antecedent events

were ineffective. One explanation centres on the fact that the antecedent events do not provide the child with any information regarding the nature or desirability of sharing. The mentally retarded child, in particular, may be slow to perceive the changes in the environment and to act accordingly. In addition, the antecedent events which were manipulated in Experiments 2, 3, and 4 did not teach the child any new skills. It is likely that without explicit training, the mentally retarded child will not spontaneously develop sharing skills because these skills do not already exist in the child's repertoire. Thus, the provision of instructions and contingent reinforcement for sharing which occurred in Experiments 5, 6, and 7 may have been responsible for the marked increases in sharing. These variables contain explicit information regarding the nature of sharing and the desirability of this behaviour.

Researchers have offered a number of hypotheses as to why correspondence training is effective. Risley and Hart (1968) postulated that during correspondence training, changes in nonverbal behaviour occur because verbal control over this behaviour is established. However, there is some disagreement concerning this issue. An alternative hypothesis proposed by Rogers-Warren and Baer (1976) attributes correspondence training effects to the delayed reinforcement of nonverbal behaviour rather than to the reinforcement of verbal reports. Redd (1969) provided a third explanation, namely that the correspondence effects may be due to the observers serving as discriminative stimuli for the subjects' good behaviour. The data from Experiments 6 and 7 rule out the possibility of Redd's explanation, for two reasons. First, the fact that the participants

increased their rate of sharing according to each criterion, including reversals, discounts the idea that the observers may serve as a discriminative stimuli for appropriate behaviour. If Redd's theory were correct then the participants would share at similar rates in each session and would fail to decrease their sharing when reversal was implemented. Second, during the baseline period in the middle of the experiment, the subjects reduced their sharing to near-zero levels. This would not have happened if the observers were acting as discriminative stimuli for good behaviour. It appears that the children did comprehend the verbally stated intentions which they made and that these verbalizations were instrumental in facilitating sharing.

Experiments 6 and 7 provide data which refute the claims of the remaining two hypotheses. During generalization probes, the trained children continued to share at high rates despite the fact that they were not required to verbalize their intentions and were not reinforced for sharing. Thus, the influence of verbal behaviour as proposed by Risley and Hart (1968) is questionable since the participants were not required to verbalize their intentions or past behaviour during generalization probes. In addition, the possible influence of delayed reinforcement, as suggested by Rogers-Warren and Baer (1976), may not be that significant, since no reinforcement was provided during generalization sessions. This argument is not unequivocal, however, since it is possible that other reinforcers were operating to maintain sharing behaviour during these sessions.

Based on the results of this experiment, an alternative hypothesis is proposed, namely, that the perceived control on the part of the

participant contributes greatly to the success of correspondence training. The fact that correspondence training allows the child concerned the responsibility of making decisions and organizing his/her own behaviour is part of the procedure's strength. Whitman et al. (1984) have noted that the focus of cognitive behavioural training is on establishing the individual as the locus of control. According to Whitman et al. this focus differs from traditional behaviour modification in which the external control is exerted on the person by others. Mentally retarded children in particular are likely to benefit from cognitive behavioural procedures since they are considered to be deficient in areas of self-control and dependent on others for supervision. In many aspects of their lives, mentally retarded children are not permitted to act freely and make decisions regarding their actions. The fact that correspondence training allows the child to exercise some choice and control is highly important. During the prior-to-play sessions in Experiment 6, the trained participants were asked if they thought they could share and were consulted about the number of times they would share. In addition, the use of the counting beads strengthened the idea that the children themselves were in control since they had to move the beads over and show them to the trainer at the end of the session.

The play sessions may have ressembled a kind of game with a time limit. It is noticeable from the tape recordings of play sessions that several participants (e.g., Brent, Shane, Corrina) laughed and smiled whenever they shared and moved their beads over. For example, when the trainer said "move a bead over, Shane" he was heard to laugh and remark "I'm a good boy, I am!". These findings suggest that some

of the participants at least were not waiting for the trainer's social reinforcement but were reinforcing themselves immediately for sharing. This internalization of reinforcement is interesting, given that the participants were mildly or moderately retarded and developed these behaviours without any specific instruction. These observations suggest that correspondence training has a number of reinforcing qualities which are related to the participant's perception of control, responsibility, and choice in the training situation.

Cognitive behavioural theorists have emphasized the role of cognitions in the genesis of maladaptive behaviour. In particular, these theorists have hypothesized that maladaptive behaviour results from deviant cognitive processing. However, Beidel and Turner (1986) have noted that studies which assess the effects of cognitive behavioural interventions have rarely, if ever, focused on the direct alteration of cognitions. Instead, the focus of change is behaviour and any changes in cognition appear secondary to changes in behaviour. Beidel and Turner (1986) concluded that there is no empirical support for the claims made by cognitive-behavioural theorists that their treatments are superior to traditional behavioural therapy or that their treatments address aspects of a disorder not addressed by standard behavioural techniques.

The changing criterion design which was employed in Experiments 6 and 7 proved to be very appropriate for the type of research conducted. The design catered well for low-functioning children and children with differing sharing repertoires. Children who did not share at all during Baseline 1 began with a criterion of one sharing response during training. In addition, the gradual increments in the

number of counters appeared to have beneficial effects on the children's self efficacy. Although one child (Shane) could not count correctly at the beginning of the experiment, he showed much interest in the small increases of counters and was heard to count to himself on many occasions. By the end of Phase 3, Shane's teacher reported that he was counting to 16 without difficulty.

Two investigations have been conducted in which the effects of say-do and do-say procedures were compared. Both studies indicated that say-do procedures were more effective than do-say procedures (Israel & O'Leary, 1973; Karoly & Dirks, 1977). Experiments 6 and 7 investigated the effects of say-do and do-say procedures, respectively. The results showed that both sequences were highly effective in the facilitation of sharing with mentally retarded children. One point in favour of the do-say procedure was noted. During the do-say procedure, no boy ever made incorrect verbalizations about his performance. In contrast, a number of incorrect verbalizations were made during the say-do procedure. This may have been due to the fact with the say-do sequence, the children were required to predict their future behaviour. In this situation, it was easy for the children to overestimate their ability. With the do-say procedure, the behaviour had already occurred, thus the children were required only to state what happened. In other words, the do-say verbalizations were based on fact whereas the say-do verbalizations were based on speculation. Based on this finding, researchers may wish to employ the do-say sequence if they wish to facilitate errorless learning.

One advantage of the say-do procedure is that the verbalization

period preceding the play session provided the participants with a prompt or reminder to perform the target behaviour. The do-say procedure used in Experiment 7 also involved a prior-to-play period in which instructions about sharing were provided. However, this was faded out after several sessions and the built-in prompts were no longer available, whereas these prompts were provided throughout the say-do experiment. The absence of prior-to-play prompts in Experiment 7 did not appear to have any negative effects on the participants sharing responses. It appears that these participants had sufficient cognitive skills to remember what was required of them over a 23-hour period. However, children with severe cognitive deficits may perform better with the say-do sequence. No firm conclusions can be drawn from a comparison of Experiments 6 and 7 since two different groups of participants were involved with the Experiment 6 subjects being younger.

The findings from Experiments 6 and 7 indicate that it may be better to train physical sharing rather than verbal sharing if the goal is to increase actual sharing levels. This recommendation is derived from the results of both experiments which showed that training verbal sharing did not necessarily produce increases in physical sharing. Most of the participants, particularly those from Experiment 6, did not follow up the verbal initiations with verbal agreements or physical shares. One reason for this may have been that the participants in Experiment 6 were lower functioning and did not possess sufficient social skills to behave appropriately. In addition, younger children may be less aware of the implications of the words "come and play with me". Luria (1961) and Vygotsky (1962)

noted that words come to govern behaviour as the child matures. In contrast, the participants from Experiment 7 generally responded with verbal agreements when asked to share by their partners. Two participants, Chris and Derek, actually backed up some of their verbal shares with physical ones. Warren et al. (1976) examined the effects of children's share offers on the frequency of physical sharing. These researchers found that children responded to share offers with physical shares as long as the number of share offers was not excessive. However, the children who participated in the study by Warren et al. were of normal intelligence and may have possessed adequate social skills with which to physically share.

The duration of sharing appeared to follow a set pattern throughout the correspondence training phase for physical sharing. In particular, the duration of sharing was short initially, got longer when the criterion set was approximately mid-way, and was short again when the criterion number of shares was highest. One reason for the short durations initially may be that the children were learning to share and were unable to maintain long sharing interactions. One participant, Shane, had a partner who was unwilling to share and who engaged in many share refusals and inappropriate responses. Aversive stimuli such as this may have prevented the trained children from sharing for long durations. The long durations of sharing in the middle of correspondence training may have been due to the fact that the children had mastered the sharing task by then. Finally, the shorter durations of physical sharing at the end of the correspondence training phase may have been caused by the large criterion numbers of shares. At this stage, the participants may have been concerned with

meeting the criterion and consequently reduced their sharing duration to achieve this.

Experiments 6 and 7 produced interesting findings with regard to the spontaneous modeling of untrained participants. One child from Experiment 6 (Tracey) and two boys from Experiment 7 (Marcus, Derek) appeared to imitate their trained partners. This was apparent from the identical topography of sharing responses among pairs and from the spontaneous coaching which was offered by the trained participants. Rogers-Warren and Baer (1976) also noted the presence of informal, unprogrammed peer models in their study. These researchers taught normal preschool children to share using a correspondence training procedure which included modeling and reinforcement of true verbal reports. The findings of Rogers-Warren and Baer (1976) are not surprising given the incorporation of a formal modeling component within the training procedure. However, the findings of the present experiments are exciting since the participants were not specifically trained to model behaviours and being mentally retarded, they would have more difficulty in modeling spontaneously from their peers.

It is possible that this "side effect" of correspondence training could be used to the experimenter's advantage in the facilitation of appropriate behaviour. In addition, this effect is advantageous since it requires little time and effort to engineer. Foxx et al. (1984) found that a crucial factor in the generalization and maintenance of the individual's social skills is that peers also engage in social behaviour. Training an individual in isolation may produce no long-term behavioural gains as the trained responses are gradually extinguished by the person's natural environment. For this reason,

spontaneous modeling on the part of untrained peers should be investigated further, with an emphasis on ways to maximize modeling effects.

Experiments 6 and 7 revealed training-related improvements in collateral behaviours. In many previous investigations, researchers have failed to measure the effects of an intervention on collateral behaviours. As Kazdin (1982) has noted, improvements in the target behaviour are not always accompanied by improvements in collateral behaviours. It is important that future investigations incorporate a range of both appropriate and inappropriate behaviours.

One positive collateral behaviour showed training-related increases. Positive social responses increased for 5 out of 8 children in Experiment 6 and for all participants in Experiment 7. In contrast, the data from Experiment 5 showed that increased levels of sharing did not result in higher percentages of positive social behaviour. In Experiment 5, the percentage of positive social responses remained at zero for all participants despite high levels of physical sharing. One reason for the difference in findings may be that in Experiment 5 physical sharing alone was taught while in the present experiment training involved both verbal and physical sharing. It could be that more positive social behaviour occurs when verbal sharing is specifically taught. However, there is evidence which discounts this hypothesis. One of the children who received training in physical sharing first increased his rate of positive social behaviour concurrently (i.e., Brent).

Another explanation for the dissimilar results is that the participants of the two experiments differed somewhat. All

participants of Experiment 5 were boys attending a residential school for mentally retarded males and were less socially skilled to begin with. This suggestion is supported by the fact that baseline levels of positive social behaviour were zero for all participants in Experiment 5. An alternative suggestion is that the use of edible reinforcement in Experiment 5 may have had a negative effect on positive social behaviour. Lepper (1981) proposed that the use of extrinsic rewards may sometimes have detrimental effects on subsequent behaviour. When children are given excessive reinforcement for engaging in certain behaviours this may undermine the reinforcing value of the activity per se and the children may lose interest in performing that behaviour. In Experiment 5, the participants were reinforced with edibles while in Experiment 6 they received social reinforcement only, for engaging in sharing. The two reinforcement conditions may have had different effects on the cognitions of the participants. For instance, the participants in Experiment 5 may have felt that the only reason they were sharing was to gain edibles and hence they were not motivated to engage in other positive social behaviours.

Experiments 5, 6, and 7 showed that the rate of appropriate verbalizations increased as sharing was developed. These findings are very encouraging given the fact that a number of the participants had speech disabilities and were initially reluctant to speak. In previous studies, researchers have generally focused on ways to develop language in mentally retarded children who have no existing verbal skills (Rusch & Karlan, 1983). Few studies have been conducted with mentally retarded children who already have sufficient verbal

skills but fail to employ them. Experiments 5, 6, and 7 demonstrate the potential for concurrent improvement in verbal skills as a result of sharing training. It appears that it is not necessary to train appropriate verbalizations specifically rather they may increase as sharing or social skills are developed.

Another interesting finding from Experiments 6 and 7 was that several participants engaged in higher frequencies of inappropriate responses and share refusals during the second baseline phase (i.e., Brent, Tari, Marcus). When compared with Baseline 1, the frequency of inappropriate behaviour was noticeably higher during Baseline 2. This behavioural deterioration appears to have resulted from the withdrawal of correspondence training and social reinforcement. During the initial sessions of Baseline 2, Tari and Marcus seemed unaware of the withdrawal of intervention and they continued to share at high frequencies. When informed that social reinforcement was no longer available the boys appeared angry and upset. The marked effects of the withdrawal of reinforcement are not apparent from the mean scores because these have been averaged out over a total of nine sessions. In contrast, Brent and his partner were informed of the reinforcement changes prior to session 1 of Baseline 2. Several participants from Experiment 6 complained about the withdrawal of intervention variables (Brent, Shane, Donald). However, these children appeared to have different reasons for complaint. Shane expressed his disapproval at the lack of "cuddles" while Brent stated repeatedly that he wanted to move his beads for sharing and Donald interpreted the changes as resulting from his "bad" behaviour. In the same way, the changes affected the childrens behaviour in different ways. Brent engaged in

more share refusals and inappropriate responses while Shane and Donald became subdued and sat around, rarely playing with the toys.

It is possible that the increase in undesirable behaviours during Baseline 2 was the result of extinction-induced aggression. Other researchers have noted that inappropriate behaviour may increase when reinforcement is withdrawn (e.g., Balsam & Bondy, 1983). Another explanation for the behavioural deterioration which occurred in Experiments 6 and 7 is that the participants' degree of self-control was reduced. Whitman et al. (1984) and Israel and O'Leary (1973) noted that correspondence training procedures may allow the child greater control over the situation. It is feasible that the participants became aggressive and disruptive when the possibilities for self-control and responsibilty were reduced.

Experiments 6 and 7 both demonstrated that generalization occurred across settings. This was the case for not only the trained participants but also some of the untrained participants in these experiments. One reason for the generalization effects may have been the presence of the counters in the generalization sessions. This finding illustrates the point made by Liberman, Teigen, Patterson and Baker (1973) who reported that stimulus generalization was facilitated when the training and generalization settings were similar. Another factor which may have contributed to these effects is the use of social reinforcement. Stokes and Baer (1977) noted the suitabilty of naturally occurring reinforcers in the facilitation of generalization. Previous researchers have reported that correspondence training resulted in generalization across settings (Ralph & Birnbrauer, 1986; Rogers-Warren & Baer, 1976; Whitman et al., 1982). Rogers-Warren and

Baer (1976) suggested that the do-say sequence may be more useful for enhancing generalization because there is more time (i.e., 23 hours) during which the verbalizations may affect behaviour. In Experiments 6 and 7, there were no socially significant differences between say-do and do-say procedures in the degree of generalization. Comparisons of the two experiments are limited by the fact that two different groups of children were involved.

The assessment of the independent variable revealed two interesting findings. First, it was noted that trainers differed in their degree of consistency, with some trainers being highly consistent in the application of training procedures and others being less reliable. The procedural reliability data could be used by researchers to make decisions regarding the selection of trainers. In other words, the trainers could be assessed prior to the commencement of the study and the best ones used for these purposes. A second finding was that trainers made fewer errors in the delivery of the training procedures when they had fewer children to deal with. It was found, for example, that the trainers who had one child rarely made errors whereas the trainers who had two children (i.e., one from each pair) made more errors. These errors generally consisted of saying the wrong child's name or mentioning a component of the other child's training procedure. Thus, it seems that if a trainer is involved in two different training procedures (or in different stages of the same training procedure) and is working with more than one child, then more inconsistencies in the presentation of training procedures will result.

The present findings generate some questions for future research.

One such question is whether correspondence training can be used to reduce inappropriate behaviour. In applied research to date the procedure has been employed to facilitate desirable responses such as social skills and appropriate classroom behaviour. Only one research group used correspondence training to teach children to refrain from undesirable responses (Whitman et al., 1982). However, in everyday life, parents and other caregivers use informal correspondence procedures to decrease undesirable behaviours as well as to increase desirable behaviours. Future research could investigate the effects of asking questions which require a negative reply (e.g., "Are you going to throw a tantrum/ steal/ bite your nails?"). Research is necessary to determine the relative effectiveness of the latter versus conventional methods of correspondence training.

Two problems are foreseen with the use of correspondence training to deter negative behaviour. The first problem relates to the fact that it is better to teach a desirable behaviour than it is to eliminate an undesirable behaviour. This procedure could be criticized for not providing the subject with examples of appropriate behaviour. It should be noted however that there are some behaviours (e.g., biting nails, stereotypy) for which it is difficult to express a positive alternative. For these behaviours, the use of correspondence training to deter inappropriate behaviour may be justified. The second problem is a practical one. It may be confusing to express correspondence in the negative form. For example, the child may have difficulty understanding the meaning of the comment "You said you wouldn't bite your nails today, and you didn't. Good boy." This raises the question as to whether it is

better to phrase verbalizations in the positive (e.g., I will stay in my seat) or the negative (e.g., I will not leave my seat) when using correspondence training.

The present experiments showed that sharing and appropriate social responses increased when consequent but not antecedent events were manipulated. The mentally retarded children who participated showed no behavioural change when a range of antecedent events were presented.

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